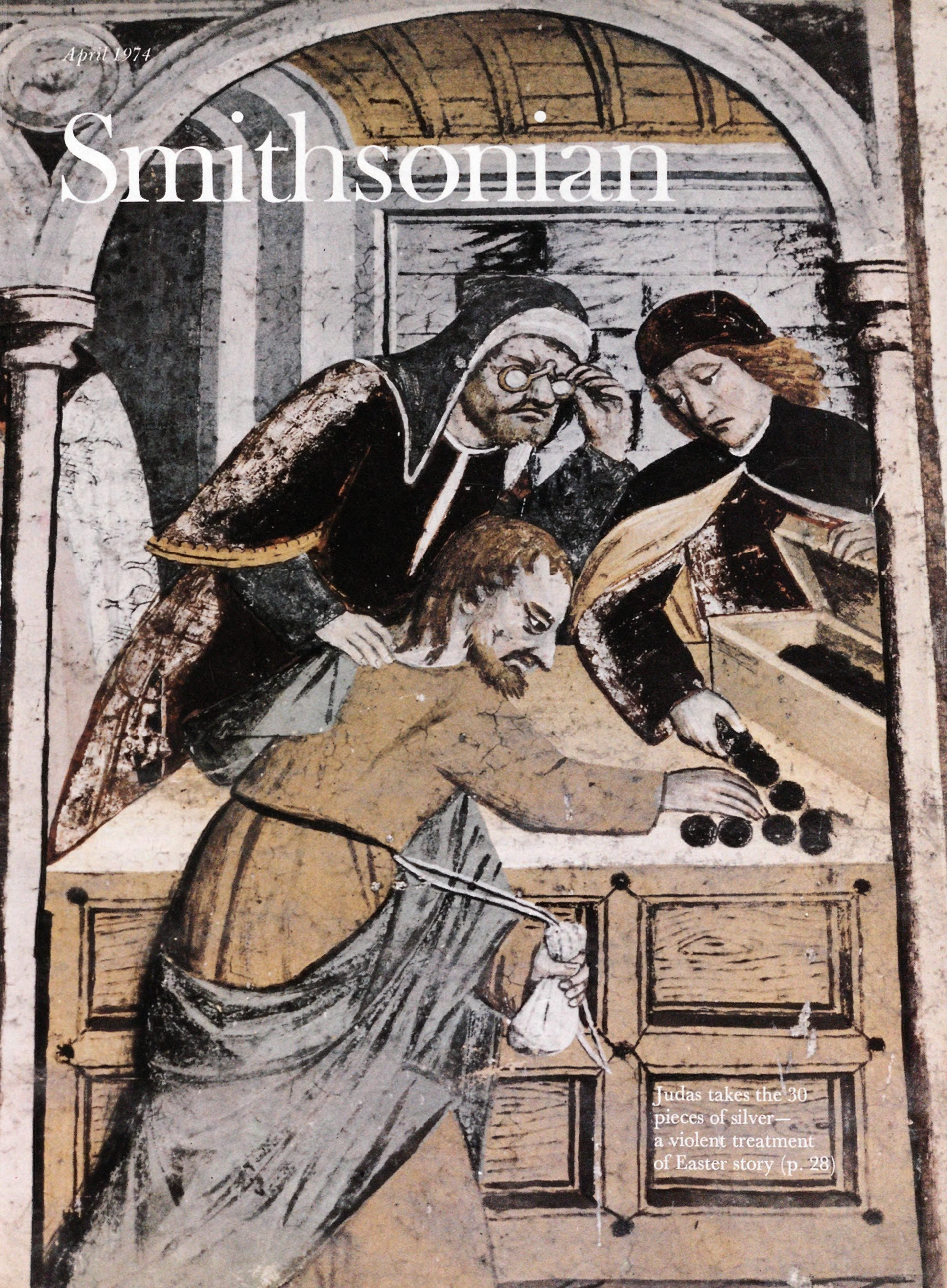
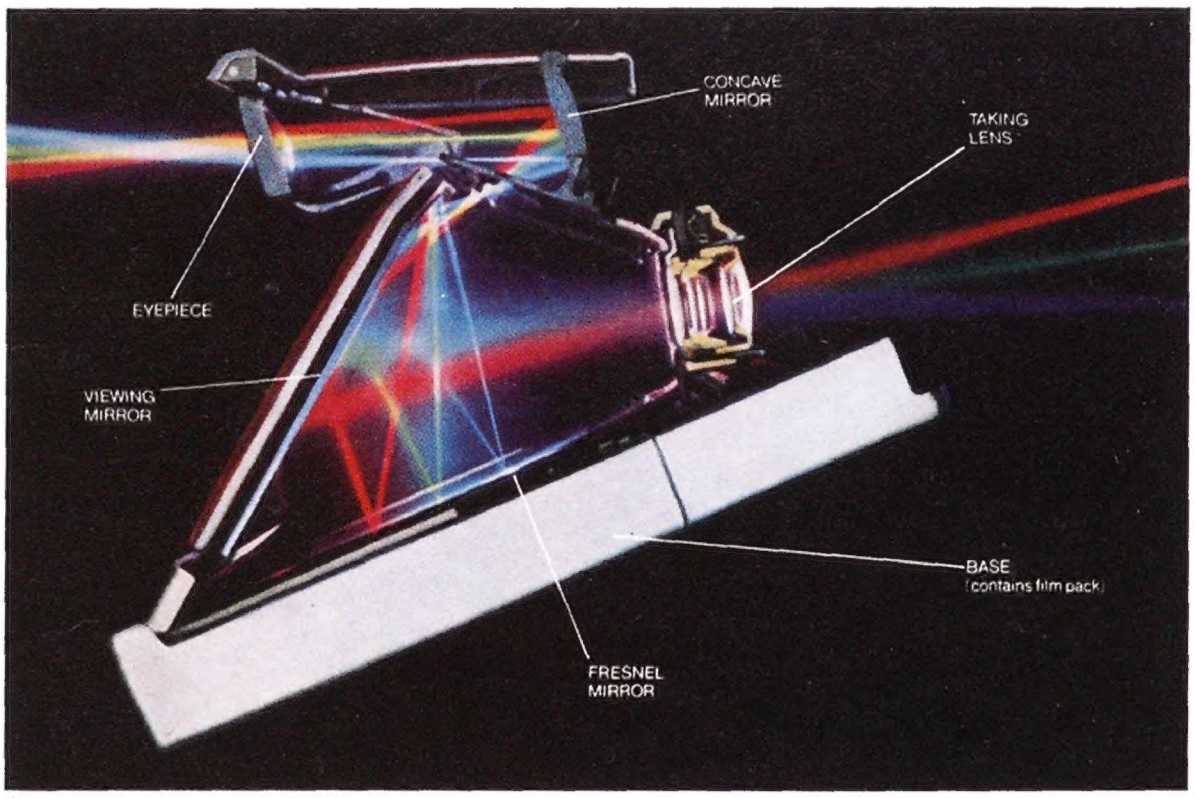
April 1974

Smithsonian



Judas takes the 30 pieces of silver—a violent treatment of Easter story (p. 28)

Polaroid's SX-70. The end of photography as you know it.



Cutaway photograph of the SX-70 using laser beams shows how you see precisely what the lens sees. When you touch the electric shutter button, the Fresnel mirror flips up and the film is exposed.

No matter how you've looked upon the act of taking pictures, instant or otherwise, picture-taking will never be the same.

A color photograph, which develops before your eyes outside the camera, is only the *beginning* of the SX-70 experience.

The rebirth of a sense of wonder and an increased awareness of the beauty that surrounds you are the end results of SX-70 picture-taking.

Watch it happen.

Remarkable as the Polaroid SX-70 Land camera is, what is important to remember is not what *it* can do, but what it enables *you* to do.

Touch the red electric shutter button and—whoosh—the picture is automatically ejected from the front of the camera.

There is nothing to time, nothing to peel, nothing to throw away.

Your picture begins developing immediately beneath a transparent, protective plastic cover. You can stack it with other pictures, handle it, put it in your pocket. You can even spill water on it and still not hinder the development process.

As the image blooms before your eyes, you realize that this will be a color photograph such as you have never seen before.

Even after you have a beautiful picture, it keeps getting better.

Minutes later, you're looking at your finished picture.

It is hard, dry, shiny, flat and extremely durable.

The image size of the picture is 3⅛ x 3⅛ inches.

The camera that makes it possible.

The SX-70 Land camera, closed, is 1 x 4 x 7 inches. Wrapped in top-grain leather, it weighs only 24 ounces.

Inside, there are over 200 transistors, a complex system of fixed and pivoting mirrors and a 12,000 r.p.m. motor, all working together to propel one brilliant picture after another into your life.

Yet all you have to do is frame, focus and touch the red electric button.

The SX-70 is a single lens reflex camera. Your eye sees precisely what the camera sees, because you're actually looking through the camera lens.

You can focus on a scene from miles away, down to 10 inches, and you can actually record far more detail than you can see without the use of a magnifying lens.

You can shoot up to 10 pictures, one every 1.5 seconds, to cover a full action sequence, like a baby's first jaunt across the room. Or you can take automatic time exposures up to 14 seconds long.

The scope of SX-70 picture-taking is as wide as your imagination will allow it to be.

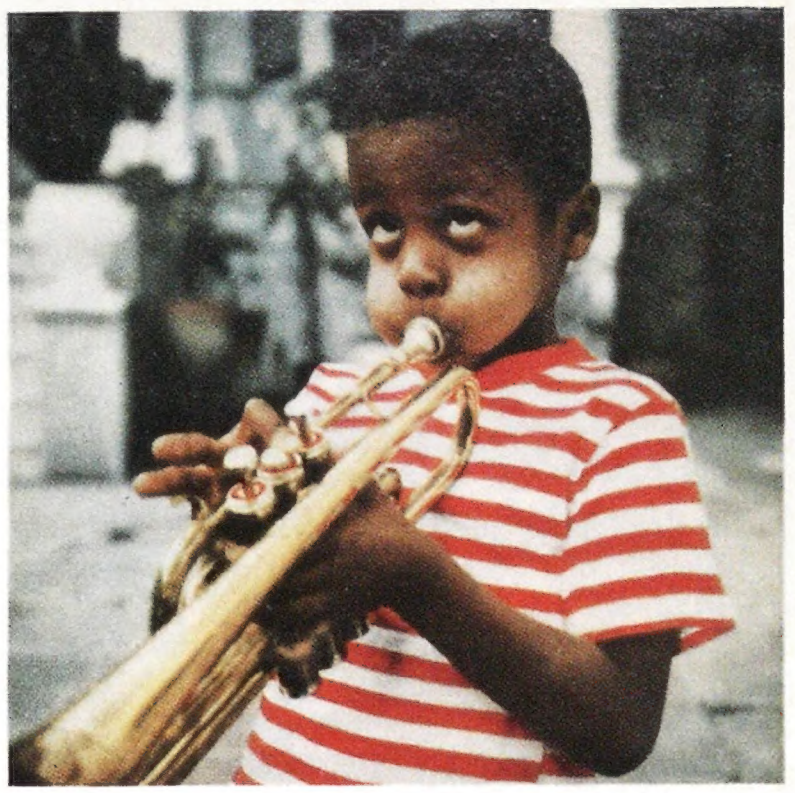
Power from the film pack.

As amazing as the Polaroid SX-70 Land camera is, the story of the other

Touch the red button and your film is automatically ejected.

In seconds, you see the faint outline of your picture.

Your picture, minutes later, fully developed.



half of the system, the film, is equally magical.

Each 10-exposure film pack is small enough to be put into your pocket, yet each contains a wafer-thin, 6-volt battery that provides fresh power to operate the camera every time you load fresh film.

A unique picture counter, located on the back of the camera, tells you how many pictures you have left. When you insert your film pack, the counter reads "10." After each successive shot, that number decreases. It even prevents the flash from firing after all 10 pictures have been taken.

Flash pictures.

Just as there are 10 exposures in each film pack, there are 10 shots on each GE FlashBar™ array (5 on each side). You can shoot flash pictures from 10 inches to 20 feet or more away. Once again, you can reshoot every 1.5 seconds, to get a full action sequence.

Nothing being left to chance, the SX-70 electronically selects the next flash to be fired. And, as you focus, the lens aperture is set automatically to let in the correct amount of light.

Outdoors, an electric eye reads the light and programs the electronic shutter for the correct exposure.

Copies and enlargements.

Because SX-70 pictures can record far more detail than the unaided eye can see, and because they are reproduced in a whole new spectrum of vibrant, highly stable dyes, beautiful copies and enlargements are easily made.

Every time you load new film, a cover sheet is automatically ejected on which you'll find directions on how to obtain copies and enlargements of your favorite SX-70 pictures.

The new photography.

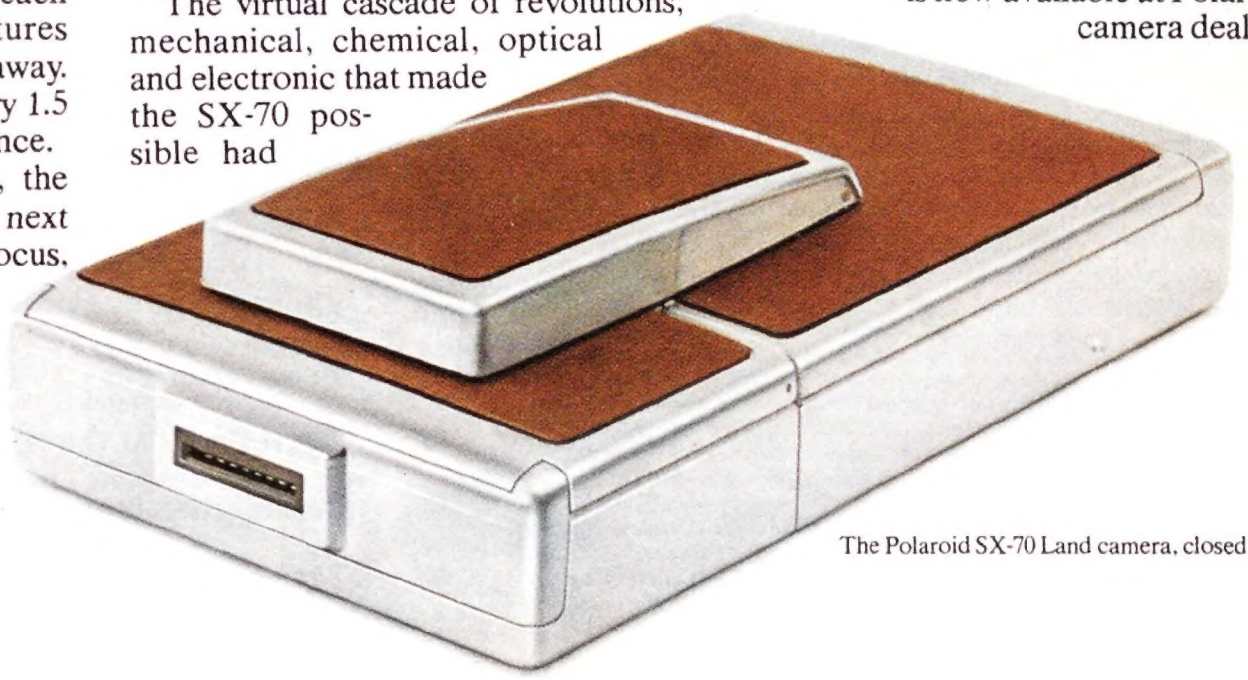
The virtual cascade of revolutions, mechanical, chemical, optical and electronic that made the SX-70 possible had only one purpose: to free you from everything cumbersome and tedious about picture-taking, so it could become at last, the simple creative act it should be.

Just frame, focus and touch the red electric shutter button. Your picture is automatically ejected to time itself and develop into a color photograph of a depth and brilliance unparalleled in amateur photography.

What once might have seemed a family duty, or even just an interesting hobby, can now become a spontaneous and recurring pleasure in your daily life.

The price.

The suggested list price of the Polaroid SX-70 Land camera is $180. It is now available at Polaroid camera dealers.



The Polaroid SX-70 Land camera, closed.

Polaroid®

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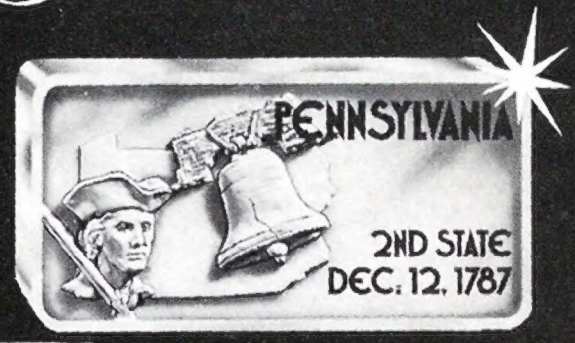

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The view from the castle

We need new educational tools to reinforce the lesson of the fuel shortage—that the world's people must learn to cooperate

In the March issue of SMITHSONIAN I wrote about the need for cooperation among peoples. Recent events in the world have shown how totally interdependent our cultural and economic systems have become. Since the creation of atomic weapons first brought home the one-world concept, no single event has served better than the present oil crisis to remind us all of the necessity of behaving as citizens of the world.

Now the chips are down, and we are seeing the old adage, "Every man for himself," come into play among various European nations as well as the less developed countries. History is full of instances of nations summoning themselves into concerted action in times of stress. Is there no hope, then, that some kind of worldwide cooperation can result from the awareness that the need for working together is not just an idealist's dream but an economic fact?

All of this points to the need for new educational tools to help bring home to all of us the sense that we are one family in one world. Any method, any means, may help in unknown ways to create an understanding of the reality of our interdependence. We believe the Smithsonian Institution could play an important and helpful role with one more museum to grace the Mall, a museum of the Family of Man.

There is a continuous need to link the chains of mankind over the generations—not only in our own country where we know that each one is the product of strands and fibers of immigration to this land from somewhere else, but also in the world at large which still speaks in many tongues. As I wrote in our Annual Report this past year: "In such a museum we could perhaps transmit something that has eluded museums as collections of objects. We could show the concept of the creations of the spirit of man, the development of ideas which arise in the human species wherever it happens to exist. Could we show the unity of man as an explorer of ideas—in art, science, invention—all the stuff of culture, moved by spirit, which occurs in our species no matter how diverse our environments?"

In such a museum we could express our diversity, celebrate our kinship and, at the same time, bring ourselves to realize the urgency of mending our ways. For a second theme in a museum of the Family of Man would stress also our ability to change the planet. The scarred surfaces of the Earth, the mauled land and the marching deserts, remind us of our lack of foresight or thrift. We have continually raided the savings bank of nature without letup. Our seas and atmosphere are full of telltale signs of our presence, suspended chemical particles bespeaking our penchant for polluting. These global problems are just beginning to be appreciated, and now some few million people in the Middle East hold a sword over our heads as surely as the leaders of the superpowers contain their sheathed atomic sabers within arrays of console buttons.

These grave difficulties will almost certainly all be with us for a prolonged period of time—long enough perhaps to remind us that the only way to save ourselves is for each of us to learn to live with all the rest of the world.

S. Dillon Ripley

Imagine a land where you can inhale the perfume of pine beside a roaring waterfall.

Cup your hands and drink deeply from a crystal-clear creek. Discover the strange mystery of mist-shrouded Forbidden Plateau. Imagine a land where you can breathe the incense of salt, cedar and seaweed on a forgotten stretch of beach.

Imagine a land where you can stroll through an English city where flowers bloom the year round. Experience a metropolis on a harbour rimmed by towering mountains you can hike on in Summer and ski down in Winter, a metropolis where you can walk in a thousand acre park just minutes from elegant hotels.

Drive through orchards that are frothy white in Spring and crimson red in Fall. Savor the Summer taste of cherry cider from a roadside fruit stand. Take in a rodeo. Discover a ghost town.

Imagine a land of seacoast. Mountains. Lakes. Rivers. Rangeland. Desert. Wheatfields.

Imagine a vacation you'll return from with a thousand faces indeliby impressed on your mind and in your memory.

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After visiting British Columbia, stop off at the B.C. Pavilion at the Spokane World's Fair. See your travel agent for information on all-inclusive package tours or write the Department of Travel Industry, 1019 Wharf Street, Victoria, B.C., Canada, V8W 2Z2.

WINE TALK

by Austin, Nichols

Château La Garde produces a fine red wine in a district better known for its whites.

If our man in Graves didn't know the district so well, he might have trouble finding Château La Garde. But this small and well-hidden estate is precisely the kind of château he tries to discover.

For although Graves is best known for its white wines, La Garde (owned by the Bordeaux firm of Eschenauer) quietly produces one of the area's richest reds. It is a full-bodied claret with a hint of the *goût de terroir,* the "earthy taste," for which red Graves are famous.

At Austin, Nichols, we go out of our way to select wines like Château La Garde red. That's just part of what makes us the world's leading importer of fine Bordeaux château wines.

Phenomena, comment and notes

Observations at the *science meeting: infidels and advocates, gasoline and gravity, and rainbows you cannot see*

SAN FRANCISCO—"Every man," said Teddy Roosevelt, "owes some of his time to the advancement of his profession" and more than 4,000 scientists had taken to the San Francisco hills to pay off their debt in late February. It was the 140th annual meeting of the American Association for the Advancement of Science and, amid the cable cars and massage parlors, there were some 125 separate meetings plus assorted lectures, addresses and presentations of films.

One might well have gotten the impression that all that scientists are interested in is money, judging from the large number of meetings devoted to analyzing that major spigot of research sustenance—the government. But of course scientists are interested in a lot of other things. Here then, somewhat adventitiously, are a few of them, as advanced in San Francisco.

Theories in collision

About two decades ago a psychoanalyst and student of ancient history with the improbable name of Immanuel Velikovsky made some improbable statements about astronomical matters. In what was not the high point in their profession's history, a number of prominent scientists threatened Velikovsky's publisher with a boycott if any more Velikovskian astronomy saw the light of day. It did anyway, and a persistent cult soon arose to which the most audible scientific response has been an occasional snort.

Velikovsky's theory is that ancient myths and legends can only be explained by assuming, among other things, that within Man's memory a comet was ejected from Jupiter, dusted off Earth a few times, collided with Mars and eventually became Venus. In San Francisco, Science finally agreed to confront Velikovsky openly.

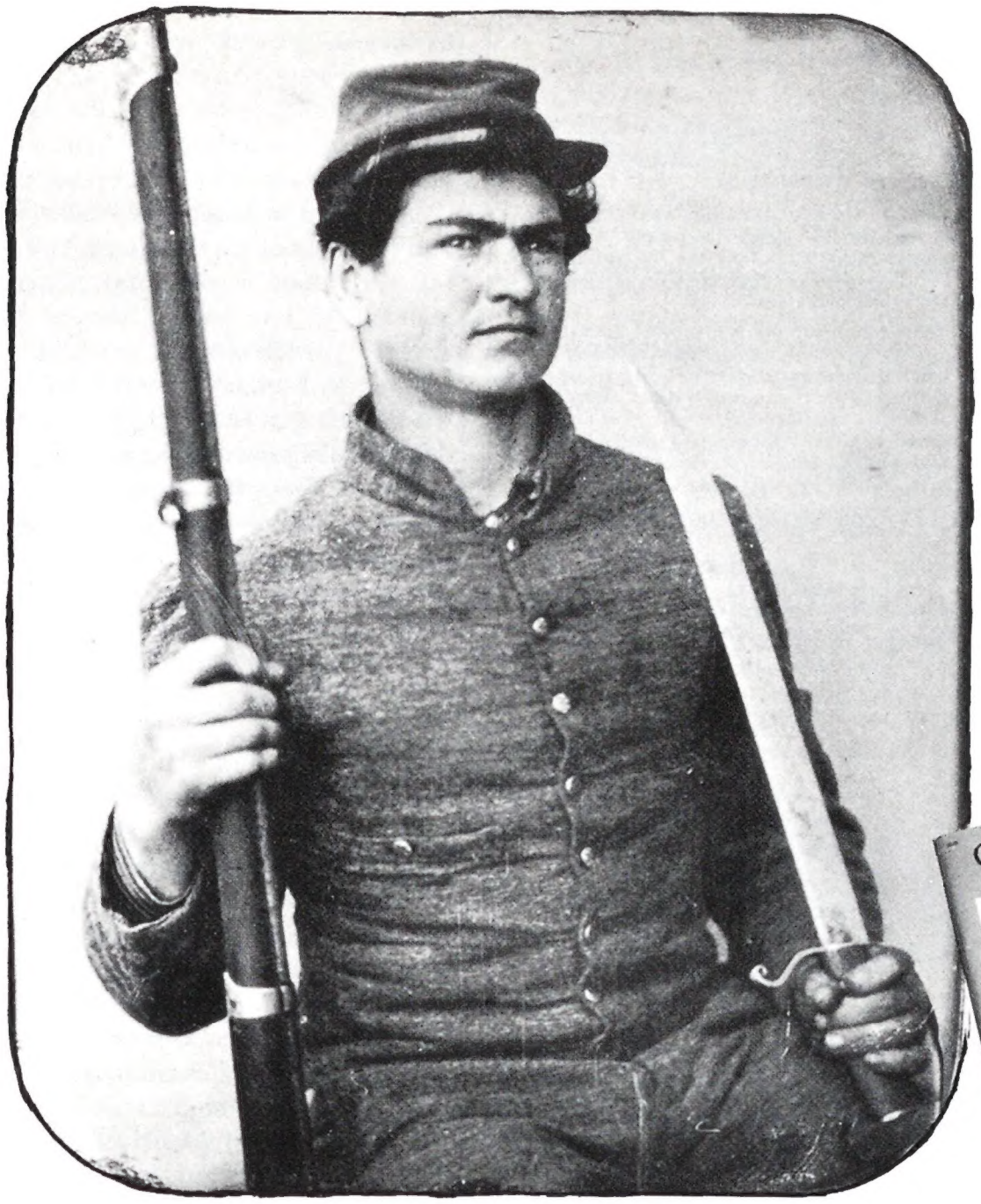
At the outset, the meeting's chairman "deplored" Velikovsky's stated intent to take more time than he had been alotted to read his defense. A young German scholar of ancient history claimed that Velikovsky used bad translations and this led to a cross-examination in the question period in which the two adversaries were forced uncomfortably close together in order to use the single microphone as they disagreed in thick accents over a Sumerian hymn.

Then, in cadences one might expect from Jeremiah, the erect, craggy maverick read off stupefyingly long lists of ancient gods and legends and reiterated his astronomical concepts. He was followed by a brief lesson in modern celestial mechanics and then by Carl Sagan, Cornell astronomer and one of the field's superstars, who listed ten demonstrably wrong Velikovskian assertions. For example, Sagan calculated, if the comet had really sprinkled Earth with enough carbohydrates to feed the children of Israel for 40 years, then space would still have to be "littered with manna and this doesn't conform to our experiments."

An outright attack

While the astronomers were making mincemeat (at least to their satisfaction) of Velikovsky, in another hotel some agricultural scientists were having at one of their *bêtes noires*—organic food. Plants, it was devastatingly pointed out by Dr. D. I. Arnon, a renowned biochemist at the University of California at Berkeley, do not know or care whether the chemicals they take up from the soil got there from manure or from a bag of factory-made fertilizer. Nitrogen, for example, is simply nitrogen, regardless of its origin. If this is true, and it seems unassailable, then what difference does it make what you use?

Why were the scientists so upset with the organic food movement? One speaker said that organic food fads raise the price



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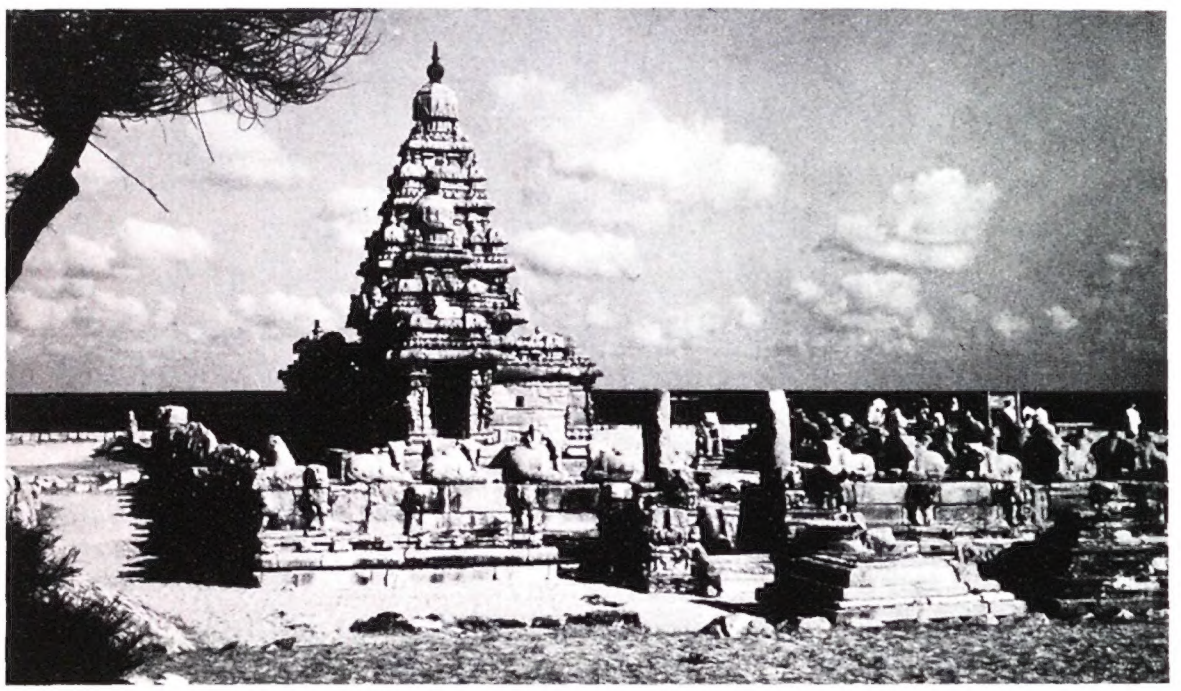

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of food in general and persuade health food "nuts" to postpone needed medical aid in the belief that their diet will save them. Organic fertilizers add the necessary nutrients but in diluted form. Therefore, it was said, they are inefficient, and in a time of food shortages and growing population, agricultural efficiency is mandatory. The leading proponents of organic gardening, the Rodales, were lumped with other "quacks," and scientists were urged to organize politically to defend themselves against the "pseudo-scientists."

All this left one with a few residual questions in mind, such as the possibility that there won't be enough chemical fertilizer to go around anyway, but there was no question and answer period.

Ominous warnings

A true believer used up a lot of paper by handing out leaflets that said if Velikovskian catastrophes had happened once, they could happen again, but the scientists were soon far too busy exploring other potential (and more probable) difficulties to keep a wary eye on Venus. For example, there was widespread agreement among climatologists that the Earth is in for a pretty big change in climate. Just when it will take place is not at all clear. It does appear, however, that the last hundred-odd years have been especially pleasant and there is some indication that we are heading into a "little ice age"—a few centuries of the kind of winters that Washington experienced at Valley Forge.

This could have fairly obvious effects on the output of modern scientific agriculture now so finely turned to the gentle climate that is, alas, on the way out. And there was a good deal of gloomy prognostication about famines and droughts growing worse. At this meeting there were also calls for more climatological research, more food production and for a global granary and various other kinds of universal sustenance insurance.

Meanwhile, in another room in the same hotel, Dr. Garret Hardin of the University of California at Santa Barbara was ticking off what he called "ten charming delusions about population" and encouraging mankind to "bite the bullet." One delusion, he said, is that a global granary or any other means of sharing the agricultural wealth is of the

slightest use at all. We have no shortages—of energy or food or any other resource. What we have is a "longage" of people. The population explosion has been likened to a cancer, he said, and "you do not cure cancer by feeding it."

Energy notes

There was a great deal of talk devoted to energy conservation and an equal amount to new sources of energy. One whole morning session was given over to discussing progress in research on fusion power, which many people have billed as a nearly unlimited source of energy if only it can be made to work. (Not all the fusion experts in San Francisco agreed with that assessment.) But perhaps the most arresting comment on energy was made by a political scientist, Lynton Caldwell of Indiana University at Bloomington, whose report sounded at times a bit like a stern lecture from the Cosmic Schoolmaster.

"The most disastrous energy development," he said, "could be the sudden availability of a cheap, inexhaustible, on-site generated supply. At the present stage of human development, this gift, like the touch of Midas, could become a devastating social blight. There is no quicker way to destroy a society than to confer upon it power that it lacks the wisdom, consensus, restraint and institutional means to handle."

The real reason for the lines at gas stations is gravity, said one speaker in all seriousness. The gravitational constant in the universe, he explained, dictates that all the planets that form, including our own, must be roughly spherical and a sphere means a limited surface and that means limited resources: hence, all the shortages. Now, doesn't that make you feel better?

No doubt you have seen the toy sometimes called Dippy Duck—the glass duck that bobs back and forth, endlessly "drinking" from a glass of water. A physicist held one up and suggested that California build a Brobdingnagian version of this toy and have it drink perpetually from the Pacific, meanwhile harnessing its motion to run generators. The only problem, he pointed out, is that religious cults grow up very quickly in California and before long a lot of people would be

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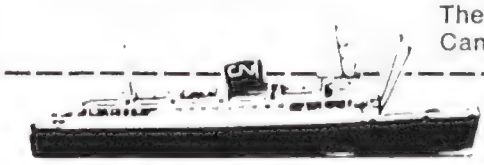

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spending all their time on their knees, bobbing in unison with the Great Duck.

On behalf of the humble

Not all of the meetings were on global signs of ill health and not all of the scientific advocacy was designed to drive infidels from the temple. One scientist took up the cudgels for what has to be the least likely cause since the naturalist Marston Bates suggested a Society for the Prevention of Cruelty to Parasites.

Dr. Eugene V. Coan and the Sierra Club Foundation have found to their joint distress that 150 species and subspecies of Western snails and slugs are threatened, 11 of them so deeply they qualify as proper candidates for the official list of the endangered. One such is *Helminthoglypta allynsmithi* which is found only on choice mossy rockslides in a canyon near Yosemite Valley. (*H. allynsmithi,* we should point out, is no relation to H. Allen Smith who sometimes is found in the pages of SMITHSONIAN and who was doing fine when we last heard from him.) "Until recently," said Dr. Coan, "mollusks and invertebrates in general have been animals without advocates." Who knows? Maybe we will soon see a lot of bumper stickers saying, "Save our slugs."

Somewhere over (or under) the rainbow

Almost everyone has seen a rainbow, which occurs when light is refracted from drops of moisture in the atmosphere. But just beyond light in the electromagnetic spectrum is infrared, which human eyes cannot see. Is it possible, however, that there have been infrared rainbows out there unseen for all these millennia?

The answer is yes. Some time ago, a physicist named Robert Greenler of the University of Wisconsin at Milwaukee concocted a rainbow by using a garden hose and photographed it with infrared film and a filter that screened out all visible wavelengths. And sure enough, an infrared rainbow showed up on the film as a distinct white arc.

After a round of applause greeted Dr. Greenler's announcement, he confessed that his finding was not perhaps of earth-shattering import but, he said, it is simply nice to know such things. And, you know, it is.

JAMES K. PAGE JR.

How Garbage Can Help Solve The Energy Crisis

Imaginative public officials and businessmen are starting to use solid waste as a source of energy. Solid waste—plain old garbage, produced by the hundreds and thousands of tons in every community, every day. Programs are underway to burn garbage as a supplement to coal and oil, to burn it alone as a dry fuel and to convert it into fuel oil and gas.

Steel Cans Recycled

But power isn't the whole story. All the energy recovery programs call for the removal of steel cans. The magnetic property of steel makes it the easiest material to reclaim. And steel cans currently are recycled in steelmaking, copper mining and detinning. In the future, ferroalloy production and foundries may also become recycling markets. Making cans from steel saves energy and recycling saves even more.

St. Louis

25,000 homes are served with electricity generated by burning 300 tons of low sulfur household garbage —one-third of the city's daily output. The program generates revenue for the city and saves landfill space.

Baltimore

New pyrolysis plant will convert 1,000 tons of solid waste daily into gas for heating and air conditioning downtown buildings.

Ames

Municipal facilities in this Iowa city will soon operate on electricity from a garbage-burning power plant now under construction.

Chicago

Burning garbage will generate electricity for 45,000 homes and conserve about 100,000 tons of coal annually starting in 1975.

Menlo Park

A pilot energy plant which uses trash as its sole fuel is being tested in this California community.

San Diego

A new pyrolysis plant will convert garbage to fuel oil to help provide energy for utility customers.

Connecticut

11% of the state's electricity needs will be supplied by converting solid waste to energy at 10 regional centers by 1985 under a recently adopted plan.

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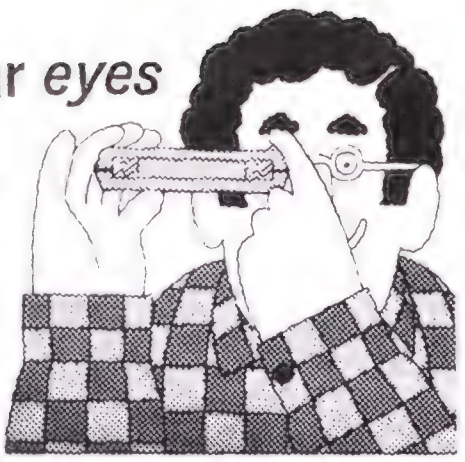

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Letters to the Editor

Folk art

Dear Sir: In Leah Gordon's article on folk art in the February issue, she notes the complaint of the distinguished American artist John Singleton Copley that people generally regarded painting as a useful trade, "like that of a carpenter, tailor or shoemaker and not as one of the noblest arts in the world."

History records that this unfortunate concept permeated English society even years afterward when the artist Copley's son was Lord Chancellor of England for the third time during an illustrious career as a lawyer and as a leader in the House of Lords. Bearing the title of Lord Lyndhurst, he died in 1863 at the age of 91. At the zenith of his power and prestige (the Lord Chancellor took precedence next after the royal family and the Archbishop of Canterbury, thus outranking even the Prime Minister), a testimonial banquet was given for Lyndhurst and, in what was intended to be complimentary, extolled him as the son of a house painter. Lord Lyndhurst was deeply offended. He was proud of his father.

History credits Lyndhurst with the enactment of the Oaths Bill, allowing admission of and leading to the election of the first Jew to Parliament. What a contrast with the conduct of a real house painter who in our times tried to eliminate the Jewish people from the world.

Arthur D. Condon
Annapolis, Maryland

Dear Sir: Leah Gordon's reference to artist Edward Hicks' numerous canvases based on the Isaiah prophecy that one day the lion would lie down with the

lamb is a reminder of how common usage has led the public to accept this version of the verse as fact. Actually, Isaiah 11:6 reads: "The wolf also shall dwell with the lamb, and the leopard shall lie down with the kid; and the calf and the young lion and the fatling together; and a little child shall lead them."
Patricia Parks Butterfield
Waverly, Tennessee

Magellan

Dear Sir: Who took the great pictures of Samuel Eliot Morison and the Strait of Magellan?
Thomas J. Edwards
New York City
Bill Ray, formerly of Life, *was the photographer. Although he was listed in the picture credits, his byline was inadvertently dropped from the article itself.* Ed.

Adrian Kantrowitz

Dear Sir: In Daniel Jack Chasan's article on Dr. Adrian Kantrowitz, he noted that a committee established by the National Heart and Lung Institute to study the implications of the artificial heart program recommended that the United States avoid committing itself to a nuclear power source. But the article also pointed out that both the NHLI and the Atomic Energy Commission have been pushing nuclear power sources pretty hard, and the research now in progress is undoubtedly going to continue.

In citing "conspicuous disadvantages to the nuclear system," the committee noted the possibility of health hazards resulting from radiation exposure (see p. 20). Such hazards, including cancer and genetic damage, would affect the artificial-heart recipient's family and all his close associates. This raises the question of whether it is justifiable to expose the population at large to such hazards, especially when the battery-powered system is being developed as an alternative. On an issue of such great public interest, much more public debate is required.
Mark S. Frankel
George Washington University
Washington, D.C.

A lallapalooza language

Dear Sir: Mary Helen Dohan's article on the worldwide roots of American speech reminded me of the difference between American English and English English.

When we were in London recently, my sister-in-law sprained her ankle, and my wife went to a nearby shop (*not* a store) to buy a cane for her. The clerk regarded her with amazement. Then, my wife indicated by limping why she wanted a cane. The puzzled clerk exclaimed, "Oh, what you want is a *walking stick!*" Obviously, in England, a cane is something used to reprimand a naughty child.
Charles E. Rogers
Washington, D.C.
Alas, we also fell into an English habit, dropping the H, and substituted Ellen for Helen in the author's name. Ed.

Dear Sir: Miss Dohan's article reminded me of H.L. Mencken's book, *The American Language,* in which he showed how the language was converted by the immigrant's effort at becoming an American.

I recall with affection such words as "minuto" for minute, "storo" for store, "barra" for bar, "giobbo" for job, "bosso" for boss because my mother, who was of Sicilian extraction, habitually used them. Of course, such Italian words as pasta and bordello have become part of our day-to-day speech patterns.
J.E. Prisin-Zano
San Francisco

Skiing in the Tetons

Dear Sir: Stuart Silk's article, "Climbing the Tetons . . . ," leaves me cold. By the author's description, the party was physically inept, improperly equipped and poorly led. I hope that others who are intrigued by this fine sport take pause and go back to the drawing board.
Joseph A. Barto jr.
Bellevue, Washington
The article was intended to warn about the dangers of insufficient preparation for such expeditions. Ed.

The Seven Sisters

Dear Sir: Liva Baker's article is incomplete without the mention of Mary Lyon among the list of "visionaries" who founded the Seven Sisters. A brilliant student and teacher, she founded Mount Holyoke Female Seminary in 1837 and is the true pioneer of women's education in this country. Unlike other founders, Mary Lyon did not have a great personal for-

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tune to donate, but rather spent four years collecting money to open her seminary by going door to door with a small velvet purse.

Denise Bencivenga Carr
West Lebanon, New Hampshire

Dear Sir: The article on the "Seven Sisters" gives the impression that the Heavenly Seven are unique in having a century-long history of education for women. Not so.

Wilson College, located in Chambersburg, Pennsylvania, received its charter in 1869 and was formally opened in 1870. The founders desired to "extend to young ladies the same high advantages for a thorough education" then available to young men.

As the trend toward coeducation has grown, Wilson College has declared emphatically its intention to maintain the institution as a college for women because the need for a superior and distinctive education for women is no less urgent today than a century ago.

Women are searching for a greater degree of equality in all phases of our lives. We are seeking a new role in society. We deserve an education designed to meet our needs, interests and concerns.

Mary Redington Galbraith
Vienna, Virginia

The article on the Seven Sisters did not claim that their centennials are unique. A number of other colleges and seminaries for women were chartered more than a century ago. Ed.

"Put on your mod bonnet . . ."

Dear Sir: One Irishman has the right to embellish the story of another one. I was intrigued by Patrick Ryan's references to the history of the Stetson and would like to add an ironic footnote.

John B. Stetson was born in 1830 and learned his trade as a hatter in Philadelphia from his father. Ill health in the late 1850s was diagnosed as consumption, and he was sent West to recuperate, West being St. Joseph, Missouri. There, he took up working in a brickyard and after two years purchased control of it. Immediately after he gained ownership, the Missouri River rose to a great flood and wiped out his entire business. Later, on an expedition to Pike's Peak, he fabricated wide-brim hats from wild rabbits for himself and fellow travelers. At the expiration of this trip—with $100 in cash—he returned to Philadelphia and established what became the great John B. Stetson Hat Company.

Now that Philadelphia no longer is the home of the famous hat and the brand name has been leased to a subsidiary in St. Joseph, Missouri, it would seem the end meets the beginning or the beginning meets the end.

Robert J. Doran
Doran Brothers, Inc.
Danbury, Connecticut

The Smithsonian Associates

GUIDE TO THE NATION'S CAPITAL

The Supplement to the April issue of the SMITHSONIAN which you will find tucked into your magazine is presented as an extra benefit for members of the Smithsonian Associates.

The Guide is truly an Associates' guide, since it derives from the information services provided to all Associates who write or visit the Associates' Reception Center in the Great Hall of the Smithsonian Institution building, known familiarly as the "Castle." Associates have clearly demonstrated what their interests are and the Guide reflects these.

Washington, like all the great capitals of history, is a focus of the historical and cultural heritage of the nation and the world. In Washington you can witness not only what is happening today but experience what has happened in the past. The monuments of heroes and the mementos of artists, craftsmen, inventors are here for all to see, as well as natural wonders and curiosities.

It is hoped that the Guide will be both a practical and a handy tool to enable you to get the best out of a visit, however short. Or if you cannot get to Washington now, you can save the Guide for later, or even just enjoy the pleasures of armchair traveling.

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200 years ago this month

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April 1774

The American spring comes tentatively—a greening of willow wands beside high-flowing streams, a dusting of white blossoms on the dogwoods in damp and aromatic forests. People who have been concerned with maintaining a semblance of bodily comfort during the winter find their minds thawing out and moving to other things. There is farming to think about; there is commerce. And these pursuits involve land and politics. In the western frontier country of Virginia, Lord Dunmore, the royal governor, tries to solidify his colony's claims, which by original charter sweep westward to the Pacific. In the Appalachians, borders are confused and the claim includes a rich slice of Pennsylvania. Ambitions and rivalries are at high tide. The Indian, as always, is the handiest target of these rising tensions.

Dunmore sends his agent, John Conolly, to investigate Virginia land claims. Captain Conolly gathers about him enough restless frontiersmen to appear a grave menace in the eyes of the Indians. There are outrages on both sides. Conolly fans the embers, for Lord Dunmore feels that a little border warfare will get Virginia's thoughts off the confounded troubles with the crown.

On the 16th of this month some renegade Cherokees, alarmed at what is shaping up as a new land-grab by white settlers, fall upon a party of traders. Conolly hears of this and warns the frontiersmen to expect more bloodshed. The frontiersmen react by causing it. One group, including a 21-year-old named George Rogers Clark, catch a couple of friendly Shawnees and scalp them. A panicky white trader, when paid a routine visit by nine peaceable Iroquois, waits until they are routinely drunk on his rum and then supervises their massacre. Among these victims are a number of women and children, and they all happen to be the kinfolk of Logan, the greatest chief around these parts. So, sure enough, the frontier is aflame, just as the ambitious governor wished.

Squire Washington is disgusted by this so-called Lord Dunmore's War. This is the region where thousands of acres have been given to veterans of the French Wars of the Fifties, and Colonel Washington has been dealing in the distribution. He sells, at the other side of the colony, a Fredericksburg farm for a handsome price of £2,000.

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of Indian arrows, there is the thunder of hooves as those fiery farmer-warriors, the Cossacks, riding like centaurs, lead a growing horde of half-starved peasants past the Ural River forts of Catherine the Great. This uprising against the czarina has been flaring on and off for two years, and right now the rebel force is licking its wounds after a defeat at Tatishchevo, west of Orinburg.

At night, around their fires, the horsemen sing their songs, some mournful, some so rousing that they rise and fling themselves into the dance. And back in St. Petersburg, Catherine ponders the strange backwardness of her people and plans to infect at least her court with some of the culture of western Europe.

Far away in Versailles, April brings a wealth of early blossoms and a positive fortune of drizzly rain. Lively young Marie Antoinette takes it into her head to sponsor the Paris opening of a new opera by that contentious German, Christoph Willibald Gluck. He is a disturbing innovator, for his operas break rules of musical formality in order to match the drama. The court is amused that the Dauphine really cares so much about Gluck's work. The only music generally associated with her are the gavottes and minuets at the masked balls she likes to attend in Paris while her husband, the Dauphin, sleeps off the fatigues of his incessant hunting. She is often out all night. He is always out all day. And thus they avoid the intimate confrontations at which—it is generally known—he is inadequate (dutifully noting his marital failures by writing the word "*Rien*" in his personal journal).

Marie schedules Gluck's *Iphigénie en Aulide* for the 13th. A singer falls ill and it is suggested that an understudy be used. Gluck storms through the palace insisting on a postponement. Marie shrugs her agreement. So on the 19th she presides at an undoubted social triumph. Eight days later, her father-in-law, Louis XV, takes to his bed with a fever.

Gluck's opera sets tongues wagging in Paris, but in Vienna, Franz Joseph Haydn is making his own operatic innovations and the 18-year-old genius, Wolfgang Amadeus Mozart, has startled all of Europe with his mastery of all forms of music. Among the royal personages who have applauded him is His Britannic Majesty, George III.

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but he feels more at home with the music of Handel, who adopted London during the reign of George II and was in turn adopted by that monarch. His nice old-fashioned operas continue to play at Covent Garden and the King's theater in the Haymarket, even though the composer is now 15 years in his grave, and they delight George III as do so many solid conservative notions and expressions of politics as well as art.

Yet another German has lived and composed in England for some years—Johann Christian Bach, youngest son of the great Johann Sebastian Bach. And in the little town of Bonn, in the Rhine Valley of Germany, lives an odd-looking little boy named Ludwig van Beethoven. He turned three last December—the day of the Boston Tea Party.

Singing has always been popular with the English. Even the redcoats, these generally despised professional soldiers of the king, are apt to roar out their songs in the evening, after the fifes have squealed them on the march. One popular air has words that lampoon the American Colonists who fought in the French Wars of the Fifties—their yokel mannerisms, their extraordinary frugality:

"Sheep's head and vinegar,
Buttermilk and tansy,
Boston is a Yankee town,
Sing 'Hey, doodle dandy!'
First we'll take a pinch of snuff,
And then a drink of water,
And then we'll say, 'How do you do?'
And that's a Yankee supper."

They call the song "Yankee Doodle."

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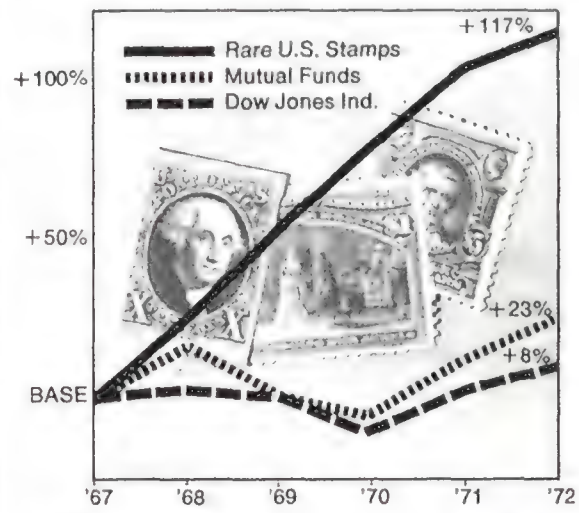

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By Dennis Farney

Ominous problem: what to do with radioactive waste

More nuclear power plants mean more of the most lethal and long-lasting of poisons, and scientists disagree about their disposal

They call it "the thousand-year problem."

It begins with a rusty-brown fluid that roils and churns inside its great underground tank, boiling in the heat from some inner fire. This dark liquid doesn't look especially sinister, but drop for drop it is one of the most hazardous, long-lived substances on Earth.

It is "high-level" radioactive waste, produced when the spent fuel of nuclear reactors is recycled. The fuel is dissolved in acid and the reusable uranium and plutonium are laboriously separated out. What remains in the end is a liquid so laden with radioactive substances that it will self-boil for years from the heat generated in decaying. Depending upon the tank design, the waste is either cooled artificially or simply allowed to boil (after much of the heat-producing strontium 90 and cesium 137 have first been removed for separate storage). At the Atomic Energy Commission's Hanford works in Washington, a million-gallon waste tank produced and stored under current procedures, would contain roughly 250 or more times the strontium 90 released by the Hiroshima bomb—and this after about 95 percent of the strontium had already been removed.

There are 65 million gallons of waste at Hanford, stored in about 150 underground tanks. Most tanks contain a good deal less than the above amount of strontium. There are some 22 million gallons elsewhere stored in giant underground tanks—most of it the byproduct of U.S. nuclear weapons-making over three decades. And, by the year 2000, the growing use of nuclear power for electricity is expected to generate the equivalent of 60 million gallons more. (There will be more signs like those above). This waste will be at least 10 to 30 times as radioactive as that at Hanford.

To contemplate this growing accumulation in terms of its outermost *potential* for harm—to man and to the intricate life chains of the Earth—is to conjure up problems so large as to be almost incomprehensible.

Consider:

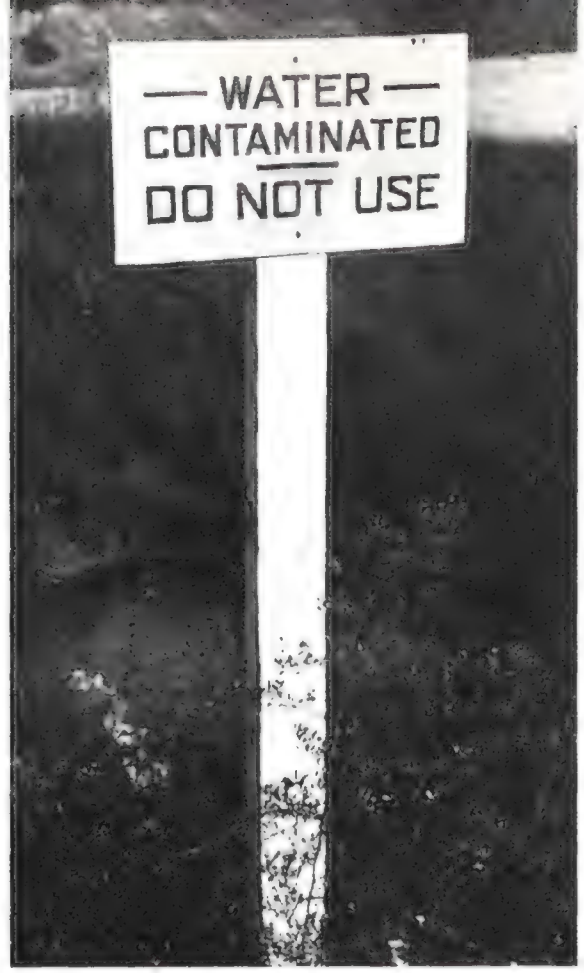
• Many of the radioisotopes within the waste do decay in short order to relatively harmless levels. An example is zirconium 95, which has a half-life of only 65 days. This means that half of a given amount will decay within the first 65 days, half of the remaining half within the next 65 and so on.

But three are very long-lived. Strontium 90 and cesium 137 both have approximately 30-year half-lives; there is so much of them within the waste that they will have to be isolated from the environment for 600 to 1,000 years. A third substance, plutonium 239 (which escapes recycling in small quantities) has a fantastically long half-life of 24,000 years. It will have to be contained for at least 250,000 years.

• Each of these substances presents its own hazards, and some are less serious than others. Plutonium's radiation is weak, incapable of penetrating even a sheet or two of newspaper. But if you inhaled even one dust particle of plutonium you would be in grave danger of lung cancer. What plutonium dictates, then, is containment; it must simply be bottled up.

Cesium emits a type of radiation which can penetrate anything short of a thick shield of lead or con-

Mr. Farney has covered a wide range of environmental and political topics for the Wall Street Journal *and edits features in the paper's Washington office.*



crete. Cesium, however, is chemically similar to potassium, so that, if ingested, it will be excreted by the body within a few weeks.

Strontium also is responsible for a penetrating type of radiation. Like cesium, it gives off great amounts of heat as it slowly decays. In addition, it is chemically similar to calcium and, if ingested, lodges in bone cells to bombard surrounding tissue with radiation for years. It is this deadly combination that makes it the most hazardous of the three.

• The standard unit of measurement for quantities of radioactivity is the curie, and one way to express the pollution potential of a radioactive substance is in the amount of water required to dilute one curie to drinking water purity. The amount necessary for one curie of strontium 90: about ten billion gallons. By the year 2000, the generation of electric power in U.S. nuclear reactors will have accumulated ten billion curies of strontium 90. An AEC computer has calculated what it would take, theoretically, to dilute these ten billion curies to drinking water purity: roughly one-fortieth of all the water in all the oceans, rivers, lakes and streams on the face of the Earth.

A *potential* problem, however, can often loom all out of proportion to a *realistic* problem. Radioactive waste becomes a threat only if it escapes into the biosystem; with no other environmental hazard has there been such "determination to minimize [this] risk at almost any cost," says a National Academy of Sciences report. The waste becomes a threat of the gravest sort if some cataclysm catapults it into the upper atmosphere to rain down as global fallout. That kind of cataclysm is extremely unlikely and the AEC's ultimate goal is to transform its waste into non-liquid forms deposited in invulnerable locations.

Simplifying the AEC's task is the fact that the volume involved is relatively small. All the waste produced by all the domestic U.S. reactors for the rest of this century theoretically could be stored, after solidification, in a single warehouse 200 feet on a side and 12½ feet high.

So much for the good news. The bad news is that the military waste, having been produced by less sophisticated chemical methods than the coming domestic waste will be, is more of a volume problem. And both the military waste and the domestic waste are going to require a "warehouse" that remains leakproof, tamperproof and foolproof for lengths of time that, in human terms, approach forever.

Whole empires have risen and fallen in a fraction of the time the strontium and cesium will have to remain sealed away. The entire recorded history of mankind is but a fraction of the 250,000-year storage time of plutonium. Neanderthal man appeared only about 75,000 years ago. The implications have reminded one thoughtful nuclear scientist of one of man's most gripping legends—Faust, who bargained his soul to the devil in exchange for power. The scientist wondered: Are short-lived man and the ephemeral institutions he creates equal to the demands of the fissioned atom?

"We nuclear people have made a Faustian bargain with society," wrote Alvin M. Weinberg, then director of the Oak Ridge National Laboratory, in *Science* in 1972. "On the one hand we offer—in the catalytic nuclear burner—an inexhaustible source of energy. . . . But the price we demand of society for this magical energy source is both a vigilance and a longevity of our social institutions that we are quite unaccustomed to. . . . Is mankind prepared to exert the eternal vigilance needed. . . ?"

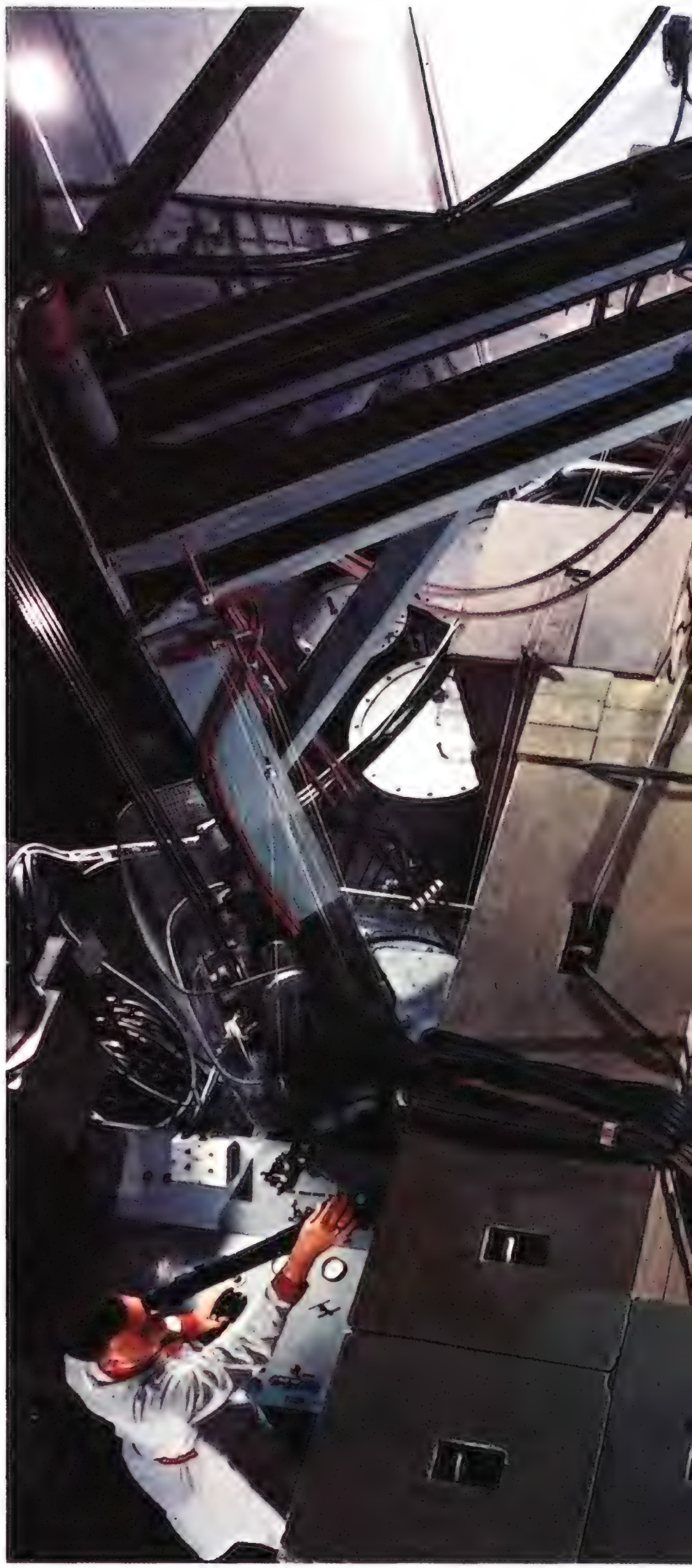
Photographs by Fritz Goro *Painting by Ron Miller*

To Weinberg personally, the bargain seemed well worth making. Nevertheless, he argued that this decision is really "trans-scientific"—so fundamental, so bound up in questions of ethics and ultimate values that only society as a whole should make it.

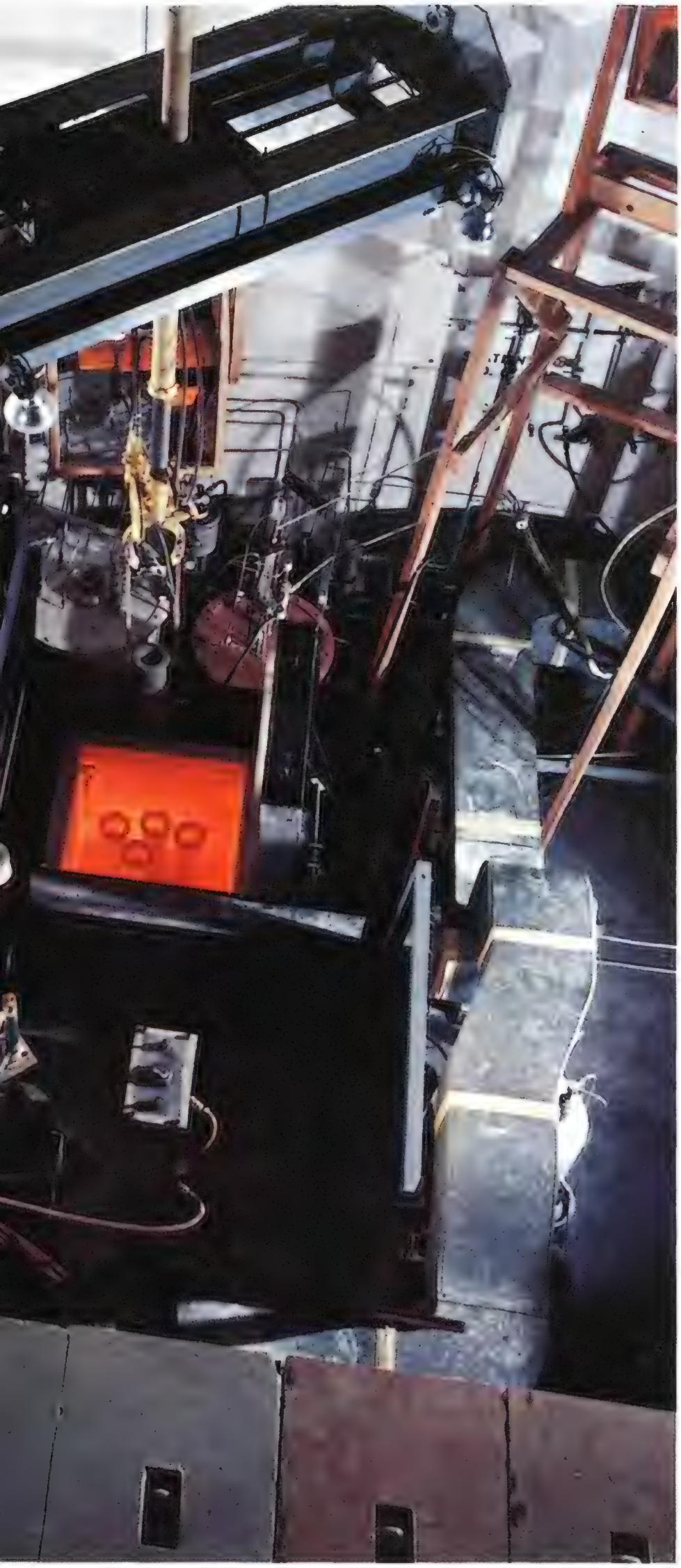
Today, with an added incentive in the form of the energy shortage, this society and others are nearing definitive commitments to the Faustian bargain. In some ways this commitment has been preceded by the kind of national debate that Weinberg thought necessary. There has been a great deal of discussion of reactor safety; there has even been some debate over such relatively esoteric problems as that of "nuclear blackmail" by terrorists who might threaten society with stolen plutonium. But, curiously, there has been relatively little public debate about the long-run implications of nuclear waste. It remains the province of experts and their views are nowhere near unanimous.

To AEC Chairman Dixy Lee Ray, the waste is "the biggest non-problem we have"—one "readily solvable" through any of a number of techniques. This spring the AEC hopes to announce plans for a man-made facility which could accommodate all the commercial waste generated for the rest of the century. Meanwhile, it is investigating "ultimate" solutions that range from entombing the wastes deep within the earth to rocketing them into outer space.

To Hannes Alfven, Nobel Prize-winning physicist at the University of California, San Diego, "a very large production of nuclear energy necessarily means the mass production of radioactive poisons in quantities which are terrifying." Until a few years ago, Alfven endorsed nuclear fission as a solution to global energy needs; now, largely because of the waste problem, he argues for a moratorium on fission reactors. He explains that nuclear fission dictates safety requirements so stringent that "no acts of God can be permitted."



Scientist at left peers through fortresslike walls at glowing radioactive cores in a research reactor



at Brookhaven National Laboratory, where tests have been made to bake wastes into a ceramic form.

Somewhere in the middle is Ralph E. Lapp, of the original Manhattan Project and today an energy consultant to the nuclear industry. Waste disposal "is just not in the same class as some other problems," he says. "It's not as dynamic as the problems associated with reactor safety," and there remains adequate time to solve the problem. Still, "I worry about it."

What worries him is that more and more nations are producing more and more waste at an increasing rate. As late as 1970, nuclear reactors produced only one percent of U.S. electrical power. Today the figure is five percent; the AEC projection for 1980 is 20 percent and for the year 2000, 60 percent. Abroad, reactors will be operating in about 30 nations by 1976.

Logically, the growing accumulation of waste should be treated as a planetary problem by some international organization. But in the real world, practices considered questionable by some nations are being used routinely, or at least being considered for use, by others. The Soviet Union, for example, is reportedly considering injecting high-level wastes deep into a water-bearing sandstone formation. Japan is looking around for a small island or two to use for storage, although just about any Japanese island will be vulnerable to earthquakes, tidal waves and typhoons. The U.S. program is among the most scrupulous and most advanced in the world, yet even here waste disposal remains at a rather low priority.

Senator Frank Church of Idaho has calculated that in the AEC's first 25 years it spent billions to develop the production side of the nuclear industry, but a mere $50 million on the waste problem. In fiscal 1975, the agency plans to spend about $29.5 million for waste management—less than eight percent of the $385.5 million budgeted for civilian reactor research and development and less than the additional $52.9 million for reactor safety activities.

A case of human error

This country began generating waste in 1944, when reactors at Hanford secretly began making plutonium for the atomic bomb. Of those hectic days, Chairman Ray said, "It was believed that the best way to handle radioactive wastes would be, put them into a tank in the ground, the tank would gradually corrode, and the material would gradually leak into the soil, and the soil would be the burying place." As a result of that decision—and the fact that the practice of putting waste in tanks continued long after the original naïveté about the hazards of waste had faded—the AEC today is stuck with some 85 million gallons of military-related waste. Although it will remain hazardous for centuries, it is occupying tanks with useful lives of about 30 years.

In eerie cavern of a salt mine in Kansas, the Atomic Energy Commission experimented with natural

The oldest of those tanks are now wearing out—and leaking. To date the AEC has experienced 17 leaks at Hanford and six at Savannah River. The most serious occurred at Hanford last spring, when a leaking tank went undetected from approximately April 20 to June 8. About 115,000 gallons of high-level waste soaked into the ground. This included an estimated 14,000 curies of strontium 90 and 40,000 curies of cesium 137.

Of course, the leak of tank 106 T can be seen as an apparent demonstration of how the escape of a potentially grave amount of waste need not necessarily lead to grave consequences. So far as it can be determined, no waste came within 100 feet of the local aquifer.

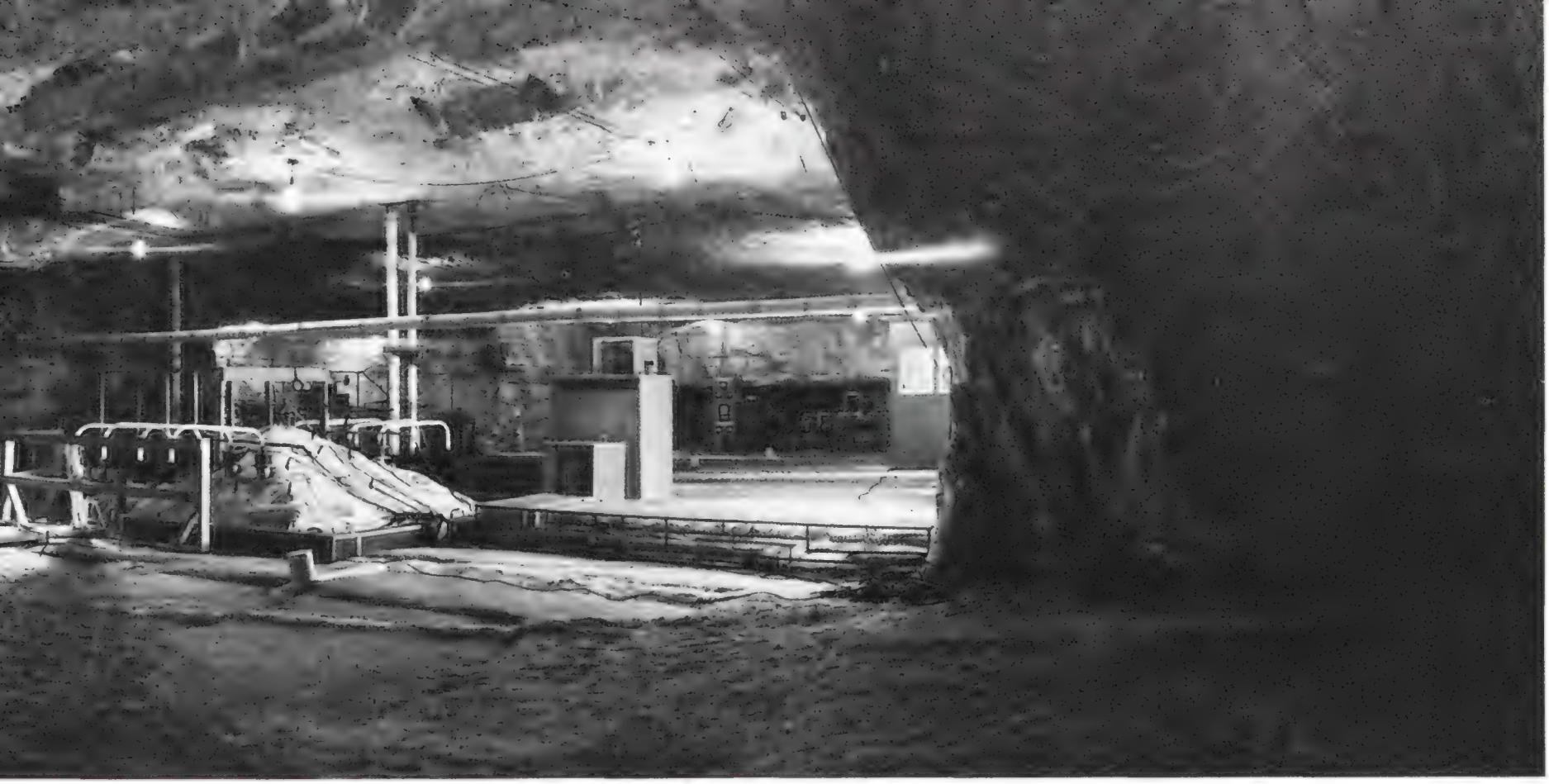
Still, even Pollyanna herself would be hard-pressed to whip up enthusiasm for such accidents. Partly as a result of them, the AEC began about nine years ago to solidify its military waste within tanks, using a process that evaporates it down to an intensely radioactive "salt cake." By the time the AEC catches up to current production (in 1977 or so), it will have some 380,000 tons of radioactive salt on its hands, and no one is quite sure just what will be done with it. At the least it will be less vulnerable to accidents.

The AEC simply got behind on its military waste. It does not intend to make the same mistake with the commercial waste, now totaling a mere 600,000 gallons but beginning to accumulate. AEC regulations do require contractors to solidify the commercial waste soon after it emerges from the reprocessing plant. One process would convert it from an acid solution to a granular substance that looks like a washday detergent. Others also feasible would yield glass or a ceramiclike material. Within ten years after reprocessing, the contractor is to pack the solidified waste into metal canisters and transport them to the AEC inside enormous lead "casks" that contain their radiation. What the AEC will do with the canisters for the next 249,990 years is certainly a question that intrigues scientists.

Some have seriously proposed that society create a new kind of "priesthood" to watch over the waste, much as medieval monks watched over mankind's written history in the Dark Ages. Presumably, this priesthood would have to be supranational in character and somehow insulated from the rise and fall of nations through the centuries. Other scientists think the solution lies not so much in recruiting priests but in making a storage vault that not only endures for millennia but also remains so conspicuous that future generations will never lose track of it: something along the lines of the great pyramids.

The AEC's position is that neither a perpetual priesthood nor a moratorium is warranted. ". . . Some consider [the waste] the Achilles heel of nuclear energy," Commissioner William O. Doub has testified before Congress. ". . . However, a course of action is available to us which will provide safe storage . . . for an extended period . . . while still making it possible to develop truly permanent storage and to transfer the waste to it." This refers, of course, to the AEC plan to store solidified commercial waste in a highly retrievable form inside a sturdy man-made structure while the agency continues to investigate permanent solutions. This approach does buy time. Yet in a sense it also represents an embarrassing retreat from two "permanent" solutions the AEC had been advancing when the 1970s began.

Then the solution to at least part of the problem of its military waste seemed to be "Project Bedrock." The 20 million gallons or so of the waste at Savannah



rock-salt formation as final resting place for nuclear waste, but unforeseen difficulties developed.

River would be pumped into a man-made cavern deep below the site. If all went well, the concept might then be applied to the Hanford waste as well.

But a problem developed before the idea had gone much beyond the theoretical stage. The proposed cavern would lie about 500 feet below the Tuscaloosa aquifer, a great underground reservoir that supplies fresh water to much of South Carolina and Georgia. Could the AEC be absolutely certain the waste wouldn't someday pollute the aquifer? After initially defending the concept in the face of mounting alarm and criticism, the AEC has now pigeonholed it, probably for good.

The seeming solution to the commercial waste appeared to lie in an abandoned salt mine a half-mile outside the county seat town of Lyons, Kansas. There, a thousand feet below, the AEC proposed, if tests proved favorable, to bury all the commercial waste produced for the rest of this century.

Scientific advisory committees had recommended burial of solidified waste in bedded salt as the safest current alternative. Bedded salt deposits are among the most stable geologic structures known. Since salt is highly soluble in water, the mere presence of it automatically denotes the absence of water—in the case of the deposits under Lyons, for some 250 million years. In addition, rock salt roughly equals concrete as a radiation shield and is so plastic under heat and stress that fissures from an earthquake would be self-healing.

Even so, political opposition began to build in Kansas. The AEC strongly defended its Lyons site, until a disturbing discovery was made. Less than a half-mile away from the agency's proposed repository was a still-active salt mine where owners had previously experimented with a hydraulic fracturing mining technique. In one such experiment, the operators had "lost" 175,000 gallons of water. No one could be sure just where it had gone and thus no one could be absolutely sure that this and other mining techniques hadn't compromised the geological integrity of the AEC's mine. After weighing these findings, the AEC pulled out of Lyons.

Of the three types of man-made facility it is now considering, the simplest would seal individual canisters of waste inside 35-ton steel casks and arrange the casks on individual saddles on the surface of the ground. The result would be an eerie tableau a little reminiscent of the monoliths of Easter Island. Each cask would heat up from the thermal energy generated by the decaying radioisotopes inside, but natural convection would keep temperature within bounds. Each cask probably would be surrounded by a concrete housing to improve radiological protection and encourage air circulation.

The second concept would place the canisters inside a kind of superwarehouse, again designed in such a way that natural air currents would cool the casks.

The third approach would place the canisters in basins of circulating water. The water would be chilled and there would be backup cooling systems available if this primary system failed. One disadvantage of this approach is that it would require more extensive monitoring and mechanical maintenance.

As for permanent disposal solutions, an AEC con-

tractor, Battelle Pacific Northwest Laboratories, has reported these preliminary evaluations:

Outer Space. Despite the obvious appeal of this idea, it seems likely to remain impractical for a good long while. For one thing it now costs about $1,000 to put a pound of payload in an Earth-escape trajectory. A single 1,000-megawatt reactor will produce something like 70 pounds of solidified waste a year and safety considerations would dictate another 700 pounds of shielding. Thus the total annual cost per reactor would be about $1.4 million.

There is also a question of safety. As the Battelle report puts it, "there seems to be a degree of uncertainty as to whether . . . a trajectory can be achieved with sufficient accuracy to insure that a capsule will not come back to earth in an unplanned manner."

Polar Disposal. There still remain great uninhabited land masses, like Greenland and Antarctica, of seemingly little economic significance. Why not haul the wastes there? If simply deposited on the surface of the ice they would melt their way down to bedrock within a few years—and there would be absolutely no need for a backup cooling system! But, Battelle argues, too little is known about such things as the movement of glaciers in these areas. Then, too, burial of wastes in Antarctica would require amending an international treaty that now bars the disposal of atomic wastes there.

Seabed Disposal. European nations already have deposited some relatively low-level wastes at sea. So did the United States in years past, although AEC policy now forbids this. It has been suggested that high-level waste might be deposited in underwater valleys, on deep abyssal plains or on the sea floor in areas where high sedimentation rates would soon bury them. But a seabed repository would be very difficult to monitor, and it would be so hard to guarantee that something wouldn't go wrong that the idea seems likely to remain little more than a scientific curiosity.

Transmutation. The ancient alchemists who sought to change base metals into gold anticipated this concept. The modern idea is to bombard the wastes with neutrons inside a reactor and thus transmute them into shorter-lived or even harmless substances. "Transmutation may prove to be one of the best methods for treating long-lived radioactive wastes," Battelle reports. But the problem is that existing fission reactors don't do a very good job of altering cesium 137 or strontium 90. Fusion reactors (SMITHSONIAN, December 1972) do look promising, but it may be decades before they are operating.

Geologic Disposal. Despite the fiasco at Lyons, burial in bedded salt still looks promising. Although it is far from recommitting itself to this approach, the AEC is checking out virgin salt beds in Kansas and New Mexico. One variation on the geologic disposal theme would be to create a bedrock cavern—by mining, drilling or even exploding an underground nuclear device—and then introduce wastes that are so hot thermally that they would melt the surrounding rock and form a rock-waste matrix.

Conceivably, any of these concepts could prove out and thus rewrite the terms of mankind's Faustian bargain. Pessimists should recall that even the legend of Faust itself has been rewritten in a fundamental way.

In the 16th-century accounts Faust comes to horrible ends. In one version, the devil carries him off; in another, the Evil One wrings his neck. But the early 19th-century Faust of Goethe, the Faust we know today, ends much more happily. Through sheer wile, strength of character and the love of a beautiful maiden, Faust is able to enjoy the devil's power and yet escape his clutches. Social historians say that as Man's philosophic outlook gradually evolved, the legend evolved with it.

Optimists must ask: Cannot Man, through ingenuity and the help of technology, win his own bargain with the atom? Can he not enjoy its almost unlimited power and yet avoid its almost immortal pollution? It is a question all bound up with the needs of an energy-hungry planet and the silent presence of generations still centuries away from being born. And a question that, as yet, awaits a final answer.

Several proposed disposal schemes appear in the artist's composite: Huge concrete canisters lined with steel could become the nuclear age version of Easter Island monuments; deep ocean burial and deposition in polar ice caps have been suggested, along with idea of shooting wastes into space by means of a rocket.

In La Brigue, France, Notre-Dame-des-Fontaines' picturesque setting gives no clues as to the art inside.

By Robert Wernick

Medieval church offers dramatic frescoes of Passion

Judas, in addition to being arch-traitor, is a real scene-stealer in grim paintings by 15-century artist Giovanni Canavesio

Robert Wernick, a free-lance writer in Paris, wrote on medieval tapestries in last month's issue of SMITHSONIAN. *He is the author of two novels.*

The wall above is covered with Canavesio's violent treatment of the Easter story. The arched wall framing

A few miles from the Mediterranean coast, at the border between France and Italy, the palm trees and the stucco villas of the Riviera give way to a savage landscape. A road twists and tunnels for scores of miles along the raging, boulder-filled Roya River, through gorges, the banks of which rise in scarred walls and dizzying pinnacles that may remind the American visitor of the wilder parts of the Sierra country in California and Nevada.

Off one of these gorges, about 70 miles north of Menton, opens the narrow valley of a tributary

altar presents earlier scenes—from the Birth of Mary to the Presentation of Jesus in the Temple.

stream, the Levenza, pleasantly dotted with orchards and leading upward toward the bare Alpine crests which form the international frontier between France and Italy. Toward the head of the valley lies the little town of La Brigue, where about 700 people live in a cluster of old stone houses on narrow, cobbled streets, overlooked by the ruins of a feudal castle. The town is built on the shady side of the valley, to let the sun shine on the terraced vineyards painstakingly cut into the mountainside across the river.

There isn't much doing in La Brigue outside the summer tourist season, when nerve-wracked city people come to enjoy its tranquillity, its brisk clean mountain air, its skies and peaks tinted a fantastic salmon-pink at sunset, its lively trout in the foaming stream. It has something else to offer the tourists, too: A couple of miles upstream is a little chapel known as Notre-Dame-des-Fontaines, which contains, almost unknown to the world at large, one of the most vivid and dramatic fresco cycles of the 15th century. It is one of the few ensembles remaining relatively intact from the days when painters spent most of their lives

Photographs by Pierre Boulat

covering church walls with pictures that told the story of Christ, intended to divert and instruct a largely illiterate congregation.

The chapel is built on a bluff overlooking the spot where a number of springs gush intermittently, with a water of remarkable purity, to form the source of the Levenza. For centuries there has long been an aura of the sacred about this site. There was a Roman shrine to some water divinity here; its remains probably lie below the chapel, and in turn may overlie some still older, prehistoric shrine. The Christians dedicated the site to the Virgin Mary, and dozens of rudely painted plaques called ex-votos thank her for having endowed the waters with miraculous powers to cure sterility, blindness and other ills. By the 15th century, La Brigue was a well-known place of pilgrimage.

It was a much busier place then than it is today. Situated at the timberline, where the pine forests give way to mountain meadows, it served as a center for woodcutters and for migratory sheepherders. An extensive wool trade was carried on with Marseilles by Jewish merchants, whose presence is recalled by the rue du Ghetto which still remains in the town. Being close to a pass over the Alps, its inhabitants must have indulged, as they do today, in smuggling, and also perhaps in the kind of semilegalized blackmail—exacting payments for the safe conduct of travelers trying to cross the mountains—which provided much of the income for the petty feudal lords of the region.

La Brigue, French today, was then technically part

At the Last Supper, a rather wary-eyed Jesus passes a piece of bread to Judas, smiling malevolently.

The apostle John, sprawled before Jesus, seems to have swooned at the dire prophecy of betrayal.

of the Holy Roman Empire. The hereditary lords of the town were the Lascaris family, counts of Ventimiglia, descendants of a Byzantine emperor who had been blinded and deposed a couple of centuries before. Perpetually hard up, the Lascaris family sold half the sovereignty of La Brigue to the Duke of Savoy in 1426. Later, still greater troubles occurred: The Countess Margarita del Careto, belonging to a collateral but bitterly hostile branch of the family, accused Bartolommeo Lascaris of having murdered her husband; she had Lascaris kidnapped on the high seas and kept him locked up for 20 years in filthy dungeons until she could get his relatives to promise payment of a ransom.

Part of this ransom money was raised by the commune of La Brigue but was apparently not paid, or not paid promptly, for there are traces of a long and tortuous lawsuit about this money in the ancient records. (Unfortunately, there are not many ancient records to go on. Sometime around 1900 the Brigascan women, in a spontaneous outburst of rage against authority, marched on the town hall and burned it down with all its archives.) It appears that at least some of this money was spent on decorating the walls of the chapel of Notre-Dame-des-Fontaines, the exterior of which was built in more or less its present form in the 14th century.

The work was entrusted to two painters of some local renown, Jean Baleison and Giovanni Canavesio, who had already worked together on the church at Saint-Etienne-de-Tinée, another town on a gorge just below the crest of the maritime Alps.

Legends of angelic visitations

Of Baleison almost nothing is known. He was born near Coni, in Piedmont, and his hand has been recognized in many frescoes of that region. In the chapel of Notre-Dame-des-Fontaines, his task was to paint the walls and ceiling of the chancel, and he produced a charming series of scenes from the life of the Virgin, with writers of the Gospels looking on from above.

These frescoes by Baleison, which are rather poorly preserved (they have suffered much from damp and for centuries were covered with a coat of whitewash which was removed only in 1959), are delicate, composed and tranquil. They are as joyfully naïve as some of the apocryphal legends they narrate of visions and angelic visitations and miracles. It is good provincial Quattrocento work, but hardly what brings tourists out of their way.

They come, rather, to see the frescoes on the walls of the nave, done by Canavesio. Little is known about him either. He too was a Piedmontese, born in Pignerol; and if the dates given for him in the surviving records are accurate, he must have been about 70 years old when he received this commission. He had already decorated many churches and chapels on both sides of the Alps. From scattered documents, it has been concluded that he was a priest who had abandoned or been deprived of his sacerdotal privileges. Some believe that he was the tutor of Margarita's children. It was rumored that he was her lover. But in any case there is no ready explanation of why the community of La Brigue should call in someone so closely connected with their enemies.

These glimmers provide all the light that can be shed on Canavesio. Beyond them, there is nothing, except what we can observe in his masterpiece, the frescoes of Notre-Dame-des-Fontaines.

In these paintings, almost life-sized figures portray the traditional theme of Christian art—the life of Jesus—in a series of panels arranged chronologically with explanatory inscriptions in misspelled and often ungrammatical Latin, sometimes with words ballooning out, the way they do in modern comic strips, from the mouths of the characters.

The dramatic moment: Judas betrays Jesus by kissing him, the pre-arranged signal for his arrest.

Canavesio's violent frescoes

The chronicle begins on the triumphal arch, the wall separating the nave from the chancel, with 11 scenes, beginning with the Birth of Mary, leading from the Annunciation, the Nativity, the Flight into Egypt to the Presentation of Jesus in the Temple. On the lateral walls of the nave, in 26 panels, he covers the Passion—from the entry into Jerusalem, through the Last Supper, the arrest, trial and death of Jesus, to the descent into hell. On the entrance wall is a vast panorama of the Last Judgment with all its traditional profusion of images: the angel blowing the trumpet, the dead rising from their graves, the judgment of souls, the blessed in paradise and the damned in the torments of hell (pp. 36, 37)—which as usual in art provides much more picturesque and interesting material than life in heaven.

Canavesio was a man living between two worlds. On the one hand, the mark of the Italian Renaissance was on him. He had studied foreshortening, anatomy and perspective, as seen in the checkered floor in Pilate's chamber (opposite). But he uses them awkwardly; he is hardly at home with these newfangled conceptions. On the other hand, he was a man of a border country; half his nature was in the north, in France, Flanders and Alsace, which in the 15th century were still Gothic, living in the dying splendor of the Middle Ages, with its ostentation and blazonry, alongside its fascination with death and suffering.

The very costumes of his characters reveal the double pull of his sympathies. The peasants who appear in scenes like the Flight into Egypt wear costumes which were worn in the Po Valley in his day. King Herod, when he received Christ with scorn, wears a cap and robe very much like those affected by Louis XI, the crafty king of France whose conspiratorial arm often reached to these Alpine regions.

Whatever Canavesio did, he did with a penetrating realism that reaches a point of savagery. For this artist lived by drama, of the most direct and sometimes shocking kind. He could add touches of tenderness and sentiment, but he was more at home with violence and cruelty. His models undoubtedly came directly from the life around him. The soldiers of Herod slaughter the innocents with the same rough mechanical gestures that he might have seen in the butchers of La Brigue cutting up their beef. Jesus is nailed to the cross by skilled carpenters who tighten the rope around his limbs with one hand and ply the hammer with the other.

It all came from a lifetime of passionate observing. The soldiers who fought the perpetual, mean little wars of the local brigand lords—the Lascarises, the Savoys (who were to become kings of Italy) and the Grimaldis (who still reign in Monaco)—must have gone about their raping and slaughter with just this air of indifferent efficiency.

Whatever is bloodthirsty, violent or beastly aroused Canavesio's interest. Circumcision, flagellation, the crown of thorns—when there was blood to be shed, he splashed it on the walls. When the soldiers cast lots for their Savior's garment, they don't just throw dice over it, they quarrel over it, and one of them is about to stab his comrade through with a long sword. There is a look of sinister rage on his face that Canavesio must often have seen in the drunken garrisons of the towns and castles of his country.

A mad dance of rage

He was always on the watch for the drama of human discord. What landscape appears in his frescoes is a summary notation of trees and rocks; it is humanity, and especially humanity in conflict, which fascinated him. His composition is sometimes broad and simple, in the Italian manner, as in the Resurrection, where Jesus occupies the whole center of the panel as he steps out of his coffin, while at three corners the sleeping soldiers lie with their limbs twisted at right angles to make them look like so many swastikas (p. 35, bottom); or in the flagellation scene where Christ, splotched with blood and tied to a pillar, dominates the center while his tormentors circle around him in a mad dance of rage, their limbs contorted into the same swastika-like shapes.

Sometimes, on the other hand, his conception, like that of the northern artists, called for cramming the surface of the picture with every possible detail, as if to manifest the cruel jumble of life. In the Crucifixion scene there are 25 different persons, five horses, an angel, a devil, the sun, the moon, in addition to all the paraphernalia of the soldiers and the three crosses (p. 34). Canavesio includes all the agony of the three

Having assented unwillingly to Jesus' condemnation, Pontius Pilate washes his hands of the affair.

A group of soldiers, one of whom blows a horn in Jesus' ear, spit upon and slap their bound captive.

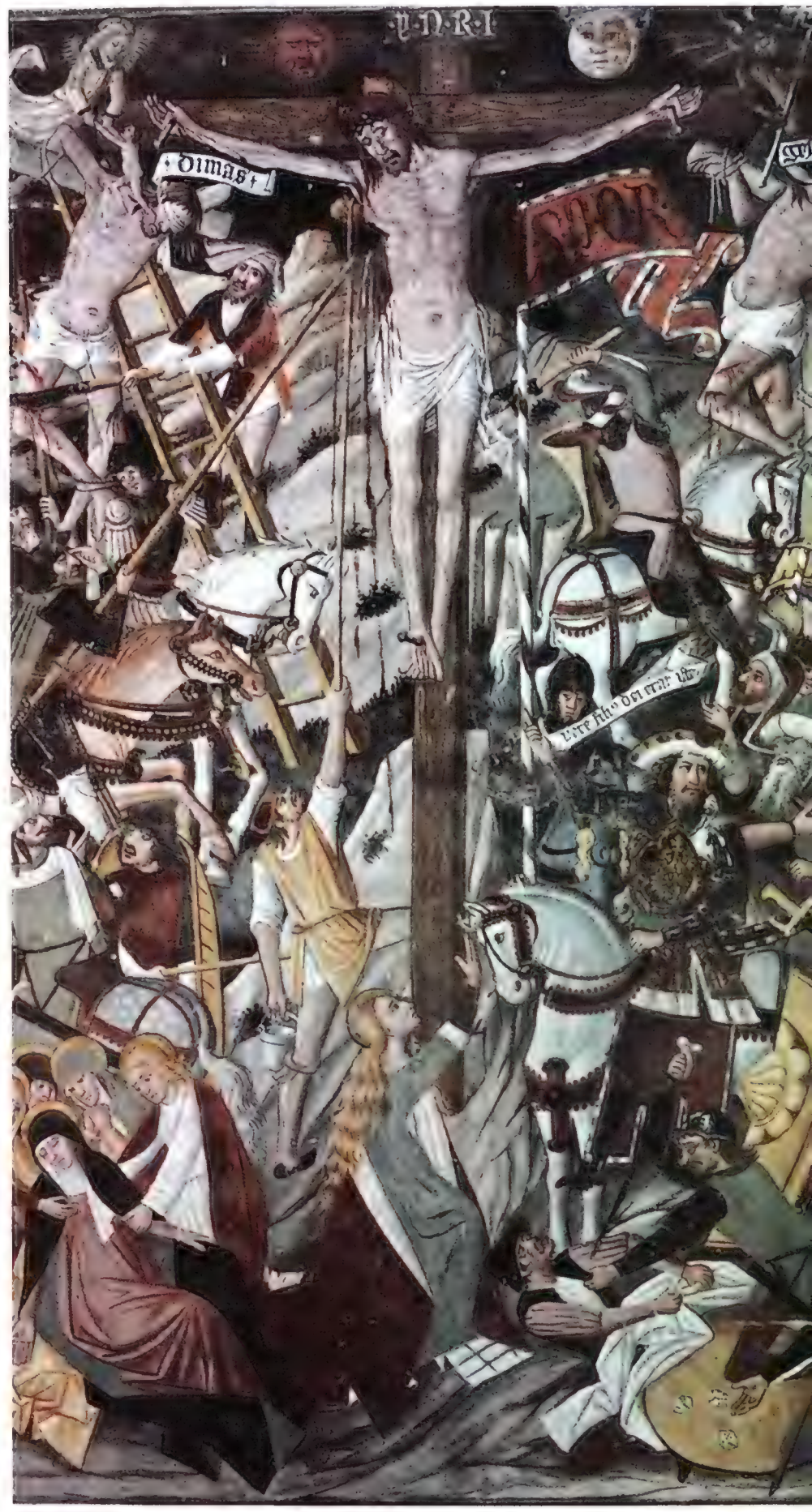
deaths (with episodes that were in fact separated in time, like the sponge soaked in vinegar and the spear through the side of Jesus, which he shows as happening simultaneously).

Part of Canavesio's fondness for melodrama can be ascribed to the taste of the time. But it is impossible not to feel a deep personal involvement on his part. The themes, subjects, characters, and many of the features and poses were dictated by tradition. But the painter had considerable leeway in illustrating the episodes, and in filling in the backgrounds.

From the evidence of his choices and his emphases, Canavesio was a man haunted by thoughts of sin and repentance. If he was indeed an unfrocked priest, it might well be the lacerating doubts of his own loyalty to his Lord that made him represent, with such intensity, a scene like the denial by Peter, which Jesus prophesied. This is a panel showing two scenes side by side: in the first, Peter sits by the fire warming his feet and hands, comfortably slouched in his chair but twisting his neck grotesquely to shout at the soldiers and the serving girl that he knows nothing of Jesus; in the second, Peter leaves the house shedding bitter tears of repentance as the cock crows, a cock swollen to the size of an eagle above Peter's head, as if to crush him with the weight of his guilt.

But it is especially in his treatment of Judas that Canavesio reveals his deepest emotions. Few other pictorial representations of the life of Jesus give so much attention to the arch-traitor. In his Last Supper, Canavesio has fastened on the Biblical words: "He that dippeth *his* hand with me in the dish, the same shall betray me." Jesus and Judas sit directly opposite each other at the table: a direct confrontation of good and evil, the calm sanctity of the Messiah seen full face, opposed to the dark tormented profile of the man who will sell him for a handful of silver. Their extended hands almost meet in the bowl placed in the center of the table (p. 30).

Two panels to the right of the Last Supper, Judas sells his master for 30 pieces of silver. Again there is a double scene. On the left, he is bargaining with the high priests, a monkey-shaped devil perched on the



In the turbulent Crucifixion scene, the sky goes dark, Mary faints and soldiers squabble over Jesus' robe.

purse which hangs from his belt. In the second, the money is being counted out under the glaring eyes of a priest, cold eyes made colder by the odd little spectacles he is wearing (see cover). The faces in both scenes are filled with a breathless cupidity and hatred —all the high drama of betrayal concentrated into look and gesture.

In St. Matthew, the act of Judas' betrayal takes place before the Last Supper, in which Jesus announces a fact that has already taken place. Here, Canavesio put it afterward, as if to augment the sin of Judas, to emphasize the enormity of an act which had been foretold but which he could not keep his mean, dirty soul from committing.

Two panels later the deed is done. In an isolated place, by lamplight, Judas leaps forward to kiss his Master and give the signal for his arrest (p. 31).

On the opposite wall, while the fearful scenes of outrage and death are being acted out around him, Judas repents. He throws the silver into the Temple, in the faces of the scowling and sneering priests. And then he goes and hangs himself (right, top).

In this last scene of the Judas story, placed in the middle of a wall, underneath a window and thus standing alone in direct contrast to the Crucifixion scene next to it, Canavesio has indulged all his taste for realistic horror. It is the only panel in the church containing but a single human figure, and everything is designed to make it most arresting.

Canavesio was faced with two contradictory accounts in the Bible: According to St. Matthew, Judas flung back his money in the Temple—and then hanged himself; the Acts says that he bought a field with the money and fell headlong into it so that "he burst asunder in the midst, and all his bowels gushed out."

A cry of ultimate disgust

Instead of choosing one or the other version, Canavesio combined both and made each form of death as hideous as possible. The details are drawn in unmercifully: the staring eyes, the contorted face, the swollen protruding tongue, the limply hanging hands and feet, the guts spilling out of the ripped, open belly, with the winged monkey-demon reaching in to pull out the little manikin by which painters of that day represented the human soul. Instead of an explanatory inscription below, there is only the betrayer's name written in outsize letters like a cry of ultimate disgust: "Judas Scariotes."

Some have supposed that Canavesio was painting himself in Judas. If so, he has concentrated here an extraordinary degree of self-loathing and, possibly, a monomaniacal despair.

An inscription beneath the Judas panel informs us

Looking guilty as sin, Judas hangs himself. The furry demon rips his manikin-like soul from his belly.

Three days after the Crucifixion, an angel pulls the lid off the sepulchre and Christ rises triumphantly.

that Canavesio's work was finished on October 12, 1492, the day on which Columbus landed in America, one of the more dramatic of the events which were to change Canavesio's world beyond all recognition. In the modern world which was emerging, La Brigue and its chapel and all the quarrels of its princes were to fade into insignificance.

The town continued to enjoy prosperity for another century or so. Then it progressively became a backwater, declining slowly to its present state of somnolence. The chapel was still the object of pilgrimages, but its frescoes were no longer admired. Baleison's choir was whitewashed, partly, it is supposed, because the more rigorous taste of the Counter-Reformation objected to his use of uncanonical accounts of the Virgin's life. Canavesio's frescoes were allowed to remain, but his Last Judgment on the entrance wall apparently had its colors darkened at some later date to accord with the tastes of a time which found his 15th-century freshness insipid.

Soldiers of the Revolution annexed La Brigue to the French republic in 1792, shot several bullets through the frescoes to express their disdain for ancient superstition, and trundled a guillotine up from Nice to take care of a local notable or two who had expressed counterrevolutionary opinions. In 1815, after the fall of Napoleon, La Brigue was restored to the house of Savoy, whose head had now become King of Sardinia. When his grandson became King of Italy in 1861 with the aid of French armies, Napoleon III got Nice and Savoy in payment. The boundary line following the crest of the mountains would have left Brigue and Tende in France, but it happened that the surrounding uplands formed a private hunting preserve that was especially dear to Victor Emmanuel, so Napoleon magnanimously allowed him to keep the two towns.

In 1947, one of the prices Italy had to pay for losing the war was to hand over the two towns to France after a plebiscite of the inhabitants voted overwhelmingly for such a step.

Since then La Brigue has followed the course of many country towns in the mountains and plains of France. The young leave to find work elsewhere. The vineyards are bare, no one is going to break his back climbing up there with a mule to repair the terraces and tend the vines. The old ways slowly fade away: The confraternities which for centuries used to organize periodic processions to the shrine of Notre-Dame-des-Fontaines—starting on foot by candlelight to hold a mass at dawn beside the gushing waters—have all died out. If pilgrims come to pray today, they come by bus or automobile.

Only Giovanni Canavesio's frescoes, with their fierce allegory of repentance and despair, remain unchanged. They remind us of how, in its great days, the religious art of medieval Christianity reached like floodwaters into the farthest corners of the land, preaching the faith with form and color, and showing shepherds and woodcutters the hope of redemption and the awful face of sin.

In this detail of the Last Judgment, several rows of the elect stand above the serpent-entwined tree of life.

In another detail, the damned, amid flames, are pushed by demons into a monstrous mouth.

By Brooks Atkinson

Fewer bluebirds are heralding spring's return

He still arrives early to nest with 'the sky on his back' and a song in his throat, but now the competition is getting stiffer

Let me explain my anxiety about eastern bluebirds. I need them; they don't need me. They nest in one of my bird boxes, use my birdbath and live off insects in the grass around my house, but they are not dependent on me for anything. In my Catskill Mountain community there are any number of hospitable birdhouses and birdbaths where they can be comfortable. If this house disappeared and its owner along with it (probable, in the long run), the bluebirds would not be inconvenienced and I am well aware that they would not miss me, as I miss them when they do not appear exactly on schedule.

I am dependent on the bluebirds for their annual assurance that the grand rhythm of life continues and that the planet is still turning and that the immortal succession of the seasons abides forever and that spring mercifully reaches up to us from the warm South and that the modest serenade of the bluebird still dismisses our winter gently. Years ago some writer in *Bird Lore* (predecessor of the contemporary *Audubon*) verbalized the bluebird song in these affectionate words: "Dear, dear. Think of it, think of it." I don't think the bluebird says anything as articulate as that—like everything else about him, his song is enigmatic. But it also is tender and intimate. It says that pleasanter days are coming soon.

I need the bluebirds for other reasons: They keep our traditions alive, making me feel emotionally close to the Plymouth Pilgrims who were elated by the glowing colors and mild personalities of bluebirds, and called them "blue robins" after the birds they knew and loved in England. Thoreau, too, felt particularly tender about them: "Princes and magistrates are often styled serene," he wrote in his journal in the spring of 1859, "but what is their turbid serenity to that ethereal serenity which the bluebird embodies?" The eastern bluebird is part of the memory of America, and I do not want to forget it. We have two other species of bluebird—the western and the mountain, both of which are also very beautiful. Although I have seen them in their native territory, the eastern bluebird is the only one with which I am familiar.

The bluebird is a thrush, smaller than the robin and the wood thrush, about the same size as the hermit, veery and olive-backed. He is bright blue on the head, chin and sides of the upper throat and on most of the wings and tail, and chestnut brown on the lower throat, breast and sides of the flanks. Thoreau inevitably said it best: He "carries the sky on his back."

No other spring bird brings us such quiet and composed loveliness. Redwings, robins, meadowlarks and flickers are spectacular. Seemingly conscious of their dramatic colors, they are exhibitionists. They announce their presence at the top of their voices.

Although the bluebird drops into our neighborhood like a flake from heaven amid the dinginess of early spring, his manners are subdued. He comes like a messenger, not a showman. In fact, I have an uncomfortable feeling that he is a little patronizing. His voice is contemplative. He moves deliberately. Hunch-shouldered, he sits immobile on the limb of a tree for what seems to be an unconscionable period, staring at the ground, lost in some bland contemplation. He seems to regard himself as one of the upper classes.

Since I am anxious to find out whether he is going to take up residence in the box visible from our dining-room window, I would like a little more action. I want him to show some enthusiasm for the rites of spring. While he is sunk in thought, a pair of tree swallows is swooping around the same box and chattering with excitement. The bluebird seems unconcerned. I have read that the male bluebird occasionally dazzles the female by fluttering 100 feet or so up in the air and then swiftly descending toward her with

Male (center) and female (top) eastern bluebirds feed with juveniles. Australian-born artist Robin Hill has painted birds all over the world.

Famed critic and columnist, Mr. Atkinson retired from the New York Times *in 1965, writes books* (See SMITHSONIAN condor article, *March 1972) and watches for bluebirds at his Catskill home.*

Concerned with bluebirds

Naturally addicted to hollow trees, the bluebird may take over an abandoned woodpecker hole.

a song of adoration. I have never seen that much eagerness. Bluebirds usually give an impression of indifference to the events around them.

I must concede that once in a while they surprise me. Once I nailed a bird box in a maple tree before breakfast. When I glanced at it after breakfast, a pair of bluebirds had already discovered it. They were going in and out of the entrance hole and perching on a nearby branch and looking over the neighborhood as if they were confirmed settlers. I had not realized that they were around, and I was naturally delighted to know that they had had our dooryard under observation for some time.

Tough bluebird chased a cat

I have read that bluebirds fight off invaders fearlessly—or perhaps that they used to. Edward Howe Forbush, the American ornithologist, was born in 1858. He was familiar with the habits of birds before the time of any contemporary ornithologist. In his classic *Birds of Massachusetts and Other New England States*, he remarks: "Notwithstanding the Bluebird's gentle appearance and the apparent weakness of its weapons of defense it is a brave and often an aggressive bird." He cites evidence of its vigorous spirit—chasing away downy woodpeckers and pulling feathers out of their tails, and: "One day some dogs chased a neighbor's cat to the top of a birdhouse. The male Bluebird attacked that cat so savagely that it got down and faced the two dogs rather than the bird."

In my experience bluebirds are not aggressive. They do not resist the tree swallows that fly around the box and keep watch from the nearby clothespole. On occasion they have let the house sparrows take the box away from them. Last spring a pair of house sparrows hovered around the box after the bluebirds had begun raising the first brood, but nothing happened. The bluebirds remained calm, and the house sparrows went away. They hopped over to the house wrens' box. Since the entrance is only the size of a quarter they couldn't get in, but they behaved like hoodlums. Suddenly the bluebird flew at them. The house sparrows silently dove down and took off in a hurry. They were afraid of the bluebird.

This is the only time I have ever seen a bluebird assert himself. In view of Forbush's assertion that once they were fighting birds, I have wondered whether the bluebird's aloofness and mildness today may be the acquired characteristic of a species that is vastly outnumbered and can no longer be considered the guardian of the neighborhood.

House sparrows in the 19th century were responsible for the first serious threat to the bluebird population. At that time bluebirds were regarded as "back-

yard" birds, as common to country and suburban America as the house sparrows are today. Then house sparrows were introduced and flourished at an alarming rate. They constituted what seemed to be a hostile invasion. They crossed the country like a plague. They attacked house wrens and purple martins. By the 1870s they had become so numerous and virulent that they took over the nesting boxes and tree cavities of the bluebirds. The sparrows became national vandals. In the 1970s they are a good deal less numerous because the automobile has replaced the horse and does not produce any nourishing by-products.

In our neighborhood, house sparrows are less dirty than their city relatives, but they still try to control wild birdlife. I once drove a pair of house sparrows away from our house wrens' box which, it seemed to me, they were besieging maliciously. They returned to the attack as soon as I left. I returned to *their* attack, but I surrendered before they did. When they eventually settled down in the bluebird box later that year, I got a ladder and cleaned out their nest. They fluttered around me as if I were a malevolent fiend, but my intrusion did not frustrate them. They had collected the trash for another nest by the next day. I cleaned out their nest for seven days and they threw nests together for seven days, and then I gave up and left them in possession. House sparrows are less pugnacious than the starlings, grackles, cowbirds and redwings which now boisterously tyrannize the neighborhood. But the sparrows' voracity and belligerence still exist. To love bluebirds is to despise house sparrows.

Starlings, the scourge today

Starlings here are the bluebird scourge of the century. The millions of them that now haunt our land originated with 120 that were liberated in New York's Central Park, 80 in 1890, the remainder a year later. They nest in tree cavities, as bluebirds used to. They intrude on bluebird territory, but they cannot squeeze through the 1½-inch hole of a bluebird box.

Every year a pair of starlings nests in our kitchen flue, 15 feet below the rim of the chimney. We can hear them fluttering up and down the chimney and we can hear the young birds squeaking in their nest, which is literally inside the kitchen. After the birds have hatched, a belligerent parent starling perches on the chimney and snarls at us if we walk by. I often wonder how the young starlings make their way up the chimney and out into the open air when at last they are ready to fly.

The starlings sometimes cling to the entrance hole of our bluebird box and doubtless would destroy the eggs or the young birds inside if they could reach far enough. They are an alarming threat to the birdlife of

Successful nesting boxes have entrances too small for starlings—only 1½ inches in diameter.

Nesting boxes must be deep enough to foil starlings that reach in for the four to six eggs.

the nation because of their enormous numbers and the ferocity with which they mob the areas they patrol. Yet other American birds survived in the days when passenger pigeons darkened the skies and broke the limbs of trees on which they perched by the hundreds. I believe the other birds—including bluebirds—will survive a similar starling era.

There are fewer nesting sites for bluebirds than there were. They used to nest in tree cavities in orchards. But fruit trees are better pruned today, and there are fewer dead limbs with holes where bluebirds can build nests. There are also fewer wooden fences and fewer suitable holes in fence posts. I don't know how seriously pesticides threaten bluebirds, for my area is not drenched with them.

Freezing weather has always taken a heavy toll of bluebirds. Winters in the South kill field insects. Then spring freezes, after the bluebirds have nested, destroy the eggs. A big freeze in the South in 1894-95 severely cut down the bluebird population, and it was five years before they started to recover and ten years before they were numerous again. Another freezing spring in 1911-12 again reduced the bluebirds and some people feared that this time, too, they were being exterminated.

In the last 15 years there have been two cold periods during which I could personally observe the effect on bluebirds. I was not aware of the destruction caused by the freezing winter of 1957-58 in the South because that spring bluebirds nested as usual in our box. I blandly assumed that what I did not see did not exist. In March of 1959, bluebirds drifted in and out of our box as usual; everything looked normally propitious. But eight inches of snow fell on March 25, and the thermometer dropped to 14 degrees. That was the end of bluebirds that year. The next year proved to be equally grim.

"There are no bluebirds anywhere in town," my notes declare. During the autumn migration I saw one bluebird on October 28. That was all for the year. The Audubon Society described the bluebird as "a disaster species," and estimated the population to be 30 percent of normal.

In May 1961 a pair of bluebirds visited our box but did not stay, and we felt bereft in fact as well as spirit. A pair did nest farther up the hill in a box that Mrs. Otto Svendsen had on the front of her garage. A hearty, hospitable woman, Mrs. Svendsen never considered the possibility of having no bluebirds around the house, and she had the only pair I knew about. In August and September of that year there seemed to be a lot of bluebirds in our neighborhood—in the birdbath, perching on the power line and in trees. I assumed that they were the family that Mrs. Svendsen had beguiled and supported and perhaps had instructed to visit her destitute neighbors. We had become charity patients. The Audubon Society estimated that the bluebird population that year amounted to no more than 18 percent of the normal figure—an alarming statistic.

Although bluebirds were scarce around our house in 1962 and 1963, they raised what I assumed were second broods on the premises—one brood in a new box I put up east of our house, and the other in a cavity in a locust tree. It was some time before I discovered where those birds were hiding. Since then the bluebird population seems to have increased enough to give us a nesting pair every year. But the numbers are nothing like what they used to be. Vernon Has-

Lawrence Zeleny, who maintains a bluebird trail at Beltsville, Maryland, feeds a tenant.

Bluebird, 6 to 7½ inches long, is considerably larger than surrounding chipping sparrows.

kins, the most persistent bird watcher in my neighborhood, has not seen a nesting pair for four years. When he was banding birds he banded 77 bluebirds in one year; that indicates the seriousness of the decline in their numbers.

Hal Borland, the nature writer who lives in Salisbury, Connecticut, used to see bluebirds regularly until about 15 years ago. Now he finds them scarce. When his wife saw a pair in the spring of 1970, he put up a bird box immediately and the bluebirds stayed. They raised one brood and disappeared. Although Mr. Borland saw a pair around the house in 1971, tree swallows grabbed the nesting box before the bluebirds could make up their minds. Tree swallows also appropriated the box the next year, and the Borlands saw no bluebirds in 1973.

W. G. Duncan of Louisville, Kentucky, deserves special attention. He has been a friend of the bluebird for years. He publishes bulletins with information about bluebirds from all over the country and he has designed a bluebird box that is manufactured by the "Bring Back Bluebird League," or so a notice reads on the box I have. But Mr. Duncan has not seen a bluebird around his house for ten years. A note in one of his bulletins reports that a teacher in Lisle, Illinois, who bands birds for the U.S. Fish and Wildlife Service, has seen only one bluebird in five years.

Since the weather has been more moderate for several years now, bluebirds are no longer a "disaster species." But they are still very much less common than they used to be a quarter-century ago. I remember one spring day during the migration season in the Thirties when the air seemed to be blue with a flight of bluebirds headed north, and the fence posts and power lines were streaked with blue. I can remember an autumn migration in 1948 when I was awakened by a bluebird banging against my bedroom screen in pursuit of a wasp. More than 100 bluebirds—young and old—danced through the trees around the house all day, lined the ridge of the garage roof and pushed one another in and out of the birdbath. They were so numerous and active that they looked like falling leaves. It was delightful. Such a sight would be miraculous today.

Although technically they are not rare today, bluebirds are uncommon enough so that thousands of people who love birds have never seen one. Bluebirds will never again have the dominance that they once enjoyed, but in the future they may flourish as semi-domesticated birds. In many parts of the country people have established "bluebird trails" by setting out birdhouses in trees or on utility poles at intervals of about 100 yards. Many of the trails have been conspicuously successful.

Lawrence Zeleny, formerly on the staff of the U.S. Department of Agriculture research center near Beltsville, Maryland, has established and maintains a bluebird trail on the Department's 13,000 acres. He described it in the Autumn 1972 issue of *The Living Wilderness*. In February 1967 he set out 11 boxes. Bluebirds nested in four. By 1972 the number of his boxes had increased to 68. They produced 52 broods and 190 young bluebirds.

To many people in Ohio, Michigan, Indiana, Mis-

Concerned with bluebirds

souri, Maryland, Virginia, Pennsylvania, New York, Manitoba and Saskatchewan, bluebirds do not appear to be scarce because they have posted trails of boxes, and bluebirds are using them in increasing numbers. If the entrance hole is exactly 1½ inches and if the box is at least six inches deep, the starlings cannot get in and cannot reach down far enough to destroy the eggs and the young. In the absence of natural nesting sites that are not occupied by starlings or other birds, boxes set out by humans will probably save the bluebird population.

Sixty years ago, before anyone imagined that bluebirds might become extinct, a monographist for the U.S. Department of Agriculture cautiously remarked: "The bird has never been accused in the writer's knowledge of depredation upon cultivated crops or of making itself obnoxious in any way." In 1915 the laconic style was appropriate. It was possible to be objective about bluebirds.

But I have not been objective about them for a long time. They are more than harmless organisms to me. They are one of the splendors of nature. In the early spring, when they are indecisively fluttering around their bird box, I have learned to watch them with skepticism and anxiety. The exultant blue on their backs and wings is exciting. But they are not excited. They do not seem to be much interested in anything. After two or three days they are likely to take off for some other place. They behave as if they were going to some secret lodge where they imagine they will be much better off than in my neighborhood. They generally return, but not always. I have not forgotten the desolate springs of 1959, 1960 and 1961.

Last year they were as unpredictable as usual. After they returned and started to build a nest, the tree swallows badgered them. Although the bluebirds put up no resistance, they did stay. For the next three weeks we enjoyed their company and felt flattered when they perched on the tree near the dining-room window and searched for food in the grass as if we were not around. They picked up insects and flew back to the box once every three or four minutes. Everything seemed to be organized and settled.

Tree swallows take over

But before I realized it, the bluebirds had vanished and the tree swallows moved in. One of the swallows sat possessively in the entrance hole like a man in shirtsleeves sitting in a tenement-house window in the city. He began to look like a settled thing. But no. After three or four days the swallows disappeared and the house wrens moved in. Noisy, busy, fearless little birds, they flew angrily at every other bird that came near the box that they had preempted. Total confusion, total war—a total mess.

In the early morning I could still hear the bluebird's cheering song and usually I could catch a glimpse of him perched on the power line. But he was obviously snubbing me. If he was getting ready to raise a second brood, he was transferring his companionship to some neighbor. It was a bitter if familiar situation. I felt like reporting him to the Audubon Society. Although bluebirds look like solid members of society, they are capricious and temperamental. I need them. But they don't need me. Around here people are more expendable than bluebirds.

Molting male and female bluebirds perch on a post. They like to nest 8 to 12 feet high.

Orphaned juveniles, hand-raised by Mr. Zeleny, cheep for their breakfast on his back porch.

We'd like you

"The amount of energy locked up in a single piece of coal is incredible. We must waste no time putting it to use."

E. L. Wilson, Manager, Pilot Plant Operations, Synthetic Fuels Research Division, Exxon.

Coal is one form of energy America has in abundance. In fact, this nation has more coal than any other country in the free world. We have mined only 10% of what we have. More than 400 billion tons of commercially extractable coal are still in the ground.

In terms of the energy this coal contains, it outweighs our oil and natural gas put together. Experts estimate that at the present rate of coal consumption, our reserves could last about 250 years.

Exxon is working on ways to expand the use of coal. We are developing methods which may let America burn more of her vast reserves of high-sulfur coal without violating standards set for air and water quality. We are also developing economical ways to turn coal into gas and oil.

Gas made from coal.

Chemically speaking, coal is similar to both natural gas and crude oil. All three are products of decayed plant or animal matter compressed into hydrocarbons over millions of years.

For years commercial plants have been gasifying coal, producing a low-energy fuel for domestic and limited industrial use. But this gas is expensive to produce, and the available processes have not been commercially proved on certain American coals.

For several years, Exxon has been developing a process to gasify the different types of American coal. Today at a pilot plant in Baytown, Texas, we are perfecting that process. High-sulfur coal from the Midwest and low-sulfur coal from the Rocky Mountain States are both being converted into raw gas.

We hope our gas will be less expensive to produce, bringing closer the day when synthetic gas can be made commercially from a wide variety of American coals.

Ten years from now, we expect plants, each producing 250 million cubic feet of synthetic gas a day, will be operating. Each of those plants could meet Cleveland's present gas needs.

At Exxon's pilot plant in Baytown, Texas, various American coals are being converted into cleaner burning synthetic gas.

Oil and gasoline made from coal.

During World War II most of Germany's planes and tanks ran on gasoline made from coal. But the problems were high cost and a relatively small yield of hydrocarbon liquid.

Now, Exxon is developing a coal liquefaction process which promises to be more efficient and less expensive than the World War II process. It also would be more flexible and reliable than other processes now being developed.

So, at another pilot plant in Texas we are converting low- and high-sulfur coal into synthetic crude oil. This oil can be refined into gasoline and other products with today's technology.

Sulfur: A major problem.

The largest potential user of coal today is industry, especially our nation's electric power plants.

Unfortunately, coal from most mines in our Appalachian and Midwestern states contains a lot of sulfur. When burned, it pollutes the air with sulfur oxides. This is a key reason why coal has not been more widely used in recent years.

Sulfur: Two possible solutions.

Exxon is now working on two processes to solve the sulfur problem.

One, being devised for the U.S. Government, would reduce the formation of sulfur oxides *while* the coal is burning.

The other process is being devel-

to know

E. L. Wilson holds a piece of high-sulfur coal from Exxon's Monterey mine in Illinois, and a bottle of synthetic crude oil made from this type of coal. This oil can be refined into gasoline and other products

oped with a major power plant builder and several electric utilities. It would remove most of the sulfur oxides from the flue gas *after* combustion but before the gas escapes from the stack.

Heat and pressure applied in the right way can convert a 4-pound piece of coal into about 1 quart of synthetic crude oil or about 32 cubic feet of synthetic gas.

When these processes—or others like them—prove commercially successful, they will enable industry to burn much more coal, freeing large quantities of oil and natural gas for other uses.

Coal's future.

The long-range success of Exxon's gasification, liquefaction and desulfurization projects depends on improving the technology and getting the costs down. As these problems are solved America will need more and more coal.

Last year, U.S. coal mines produced 603 million tons. If coal is to play a key role in filling the energy gap, production will have to more than double by 1985, and continue to increase rapidly thereafter. This means that environmental questions, primarily those of strip mining, must be resolved.

Exxon has already invested tens of millions of dollars in coal conversion and desulfurization research. In the years ahead we plan to spend many times this amount.

Coal is one of America's most important natural resources. We must waste no time putting it to use.

EXXON

Biblioteca Marciana, Venice

Idealized portraits of Petrarch and his beloved Laura face each other across title page of the first printed edition of his *Canzoniere,* published in Venice in 1470, almost a century after his death.

Photographs by Dmitri Kessel

By J. M. Edelstein

Petrarch: honored as Europe's first truly modern man

This month marks the 600th anniversary of the death of the restless poet and lover, scholar, diplomat and Citizen of the World

"You may perhaps have heard something about me—although it is doubtful that my poor little name may travel far in space and time." These are the opening words of Petrarch's *Epistle to Posterity*. Do they sound slightly self-serving and not a little vain? Indeed they do, for Petrarch could be both; he also did not expect his rhetorical self-belittlement to be taken seriously. But not even Petrarch, who spent most of his waking hours making sure that the posterity he addressed would hear about him, could have dreamed that his name would travel as far "in space and time" as it has. During this month of April 1974, the world will mark the 600th anniversary of his death. Whatever the form of these observances—and perhaps the most ambitious of them is the week-long World Petrarch Congress at the Folger Shakespeare Library in Washington, D.C.—there will be unanimous agreement that he personifies and symbolizes one of western civilization's giant leaps forward.

Petrarch spent years planning and plotting his coronation as Poet Laureate. The crowning of poets with the laurel wreath on Rome's Capitoline Hill had been a custom of the classical world, but it had not been carried out for more than a thousand years. It was Petrarch's dream not only to restore that broken tradition, to celebrate Laura, his great love, whose name in his mind was the same as poetry itself, and to restore some of the glory which had been Rome's, but also to be the one who would receive that crown on the very spot hallowed by the great poets of the past.

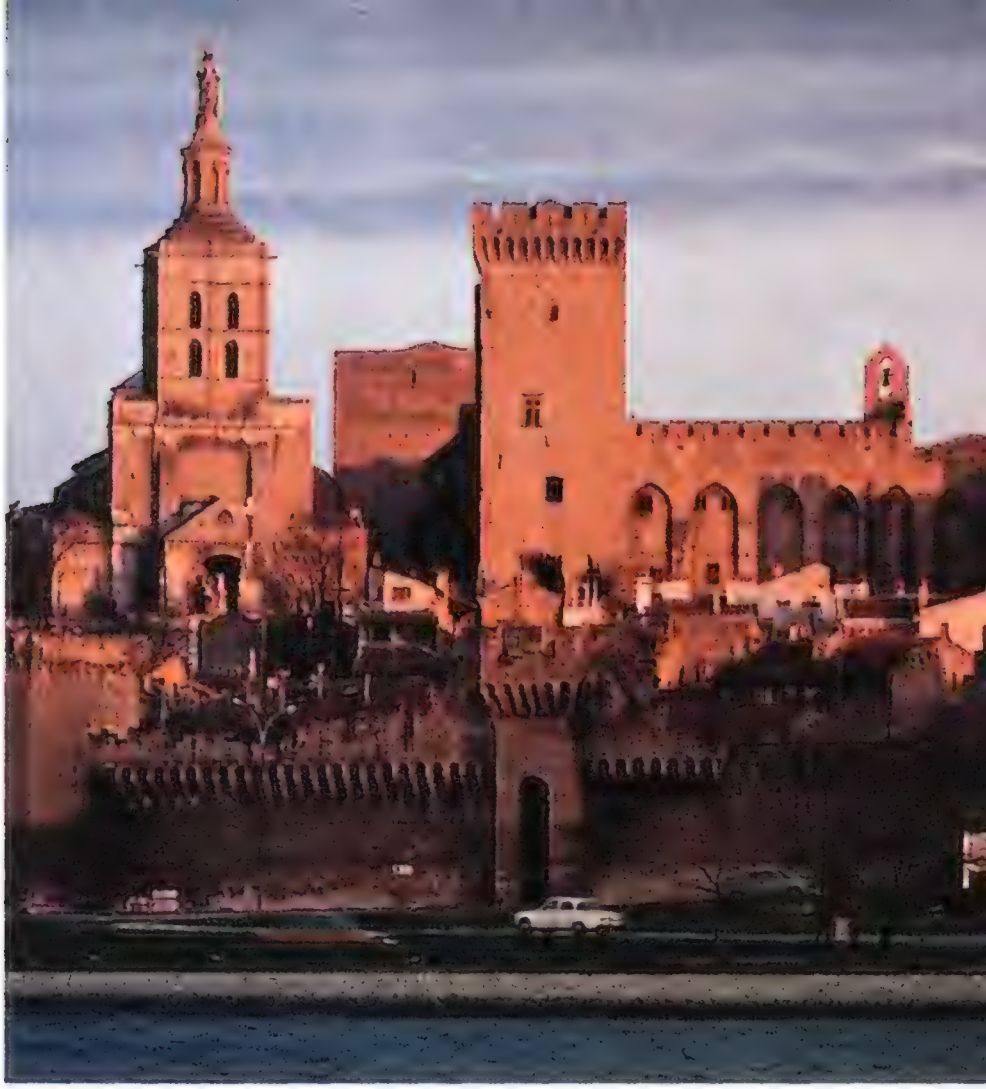
No matter that he was still only in his late thirties and that his qualifications for this high honor may have been, and at the time actually were, slight: Petrarch had powerful and very influential friends. He had no hesitation about using them, and he succeeded in his campaign. Almost too well, as a matter of fact. On the very same day, September 1, 1340, two messengers arrived at Petrarch's house in Vaucluse; one carried an invitation from the Roman Senate for Petrarch to come there and receive the laurel crown; the other presented a similar invitation from the University of Paris. There was no question, of course, which was to be accepted. After a detour to Naples to receive the approval of King Robert the Wise, Petrarch arrived in Rome on Good Friday, April 6, 1341, 14 years to the day, also a Good Friday, that he first saw Laura in the Church of Santa Chiara in Avignon. It was a fateful day, charged with symbolism and inspiration.

The scholars argue that something or other is out of kilter in this old story which Petrarch was careful to perpetuate. April 6, 1327, was not Good Friday, but Monday in Holy Week. One may take one's choice, therefore, and believe either that Petrarch saw Laura for the first time on Monday, April 6, 1327, or on Good Friday, April 10. What is important is that in Petrarch's mind the occasion and the date eventually became one. The late Morris Bishop, one of the greatest Petrarchan scholars and interpreters, calls it "the victory of subconscious desire over conscious memory" and assumes that Petrarch, not uncharacteristically, "compared his own tragedy to that of Christ." Petrarch would also have been keenly aware that Dante's *Divine Comedy* begins on Good Friday. He would say later that his own *Africa*, a great epic poem, was also first conceived and begun on a Good Friday. It must not strain belief, then, that Laura's death from the plague in 1348 did indeed happen on April 6, or so it was announced.

A man of many parts

The Petrarch Congress in Washington this month will follow the Petrarchan symbolism and scenario, from its opening on April 6, its processional to the steps of the U.S. Capitol and a reading of Petrarch's Coronation Oration there on April 8, to its closing on Good Friday, April 12, because that is the time of year in which the great dramas of Petrarch's life unfolded; but what it will truly celebrate will be Petrarch—the man, the scholar, the poet, the political reformer, the lover, the historian, the naturalist, the diplomat, the

Mr. Edelstein is Chief Librarian of the National Gallery of Art and a rare-book bibliographer.



Sunset colors the fortress-palace of the popes in Avignon, seat of the papacy from 1309 to 1377.

traveler, the Citizen of Rome, the Citizen of the World.

"Citizen of the World," as a matter of fact, is the subtitle of the Petrarch Congress, for it is that aspect of his legacy which is receiving particular attention. Six hundred years after Petrarch's death, Western culture still bears the profound imprint of his personality and his ideals. In his sense of the dignity of human life enhanced by history and art, and in his concept of an international community of the intellect, Petrarch was the first truly modern man.

Petrarch was a Citizen of the World in another sense, too. He was the paramount man of his times. We are all products of our time, as the historical determinists tell us, but it can also be said with respect to certain outstanding historical figures that the times were right for them. The 14th century, in which Petrarch lived and worked, was a midway point, "a kind of halfway house," as the historian and critic Thomas Bergin put it, and went on to say: "If all centuries are in some ways transitional, we may say, borrowing the phrase from Orwell, that some centuries are more transitional than others. And to the fourteenth more than any other, the term may be accurately applied." *The Waning of the Middle Ages* it was called by the Dutch historian Huizinga, but his title implies only half the story, for it leaves out what was still below the horizon.

Confused and turbulent, it was a century of incomparable violence and destruction as well as a century which gave birth to splendid lyric and spiritual poetry. The Pope had abandoned Rome and, for all practical purposes, was a prisoner of France in Avignon. The Hundred Years' War, mostly a matter of territorial claims and counterclaims between England and France, devastated the Continent. Those who were left were subject to famine and the plague. It is estimated that the Black Death, striking in 1348, killed fully one-third of the population of Europe, including Petrarch's Laura and his son. Italy was in chaos, its boundaries constantly changing in a feverish state of unions and disunions. Economic life was nearly at a standstill, and in the introduction to Boccaccio's *Decameron*, begun in 1348, we have a masterful portrayal of 14th-century manners and morals.

Intellectual life and the arts were also in transition. In architecture, in painting, in literature, and especially in philosophy, the century is one in which the shift of emphasis is, quite simply, from medieval to modern. This was Petrarch's world.

He was born in Italy in 1304, on July 20. "I was born in Arezzo. In a back street, Garden Lane, was the seed cast, and there sprang that arid flower, that insipid fruit that was I," said Petrarch, in that same tone of slight sarcasm and belittlement which was particularly his. His father, a notary (in those days an important and full-time profession), was in political exile from Florence. In 1309 Pope Clement V moved the papal court to Avignon, and it was near there, in Carpentras, when Petrarch was eight years old, and after migrations to Pisa, Genoa and Marseilles, that the family finally settled.

Restlessness was characteristic of Petrarch; the early moves were signals of what was to continue throughout his life. In 1316 he began to study law at Montpellier; during this period his mother died and he wrote his first extant poem about his grief. The skilled observers of Petrarch's career have noted the careful-

ness, even then, with which his emotions took second place to the construction of, and the satisfaction in, the poetry itself. In 1320, Petrarch switched from Montpellier to the University of Bologna, probably because it enjoyed a better reputation. For six years he lived the carefree, easy life, never working very hard but getting by and charming everyone, particularly women. Petrarch was a sensual man and, though he railed against it, he found it hard to put temptation behind him. During this time he also traveled widely, visiting many of the cities in northern Italy.

But the ax fell in 1326, when his father died. As soon as he got the news, he was back in Avignon, without a degree and with very little money. He managed to coast for a while, living the life of a young man about town, having a great deal of social success and beginning to write poetry regularly and seriously. But he had to live and the only way to get a job at the Papal Court or acquire a benefice was to become a cleric—so he did. The duties were few and light and they never interfered with love or poetry or study. In 1327 there was the momentous glimpse of Laura, the greatest experience of his life. Petrarch gives us the details himself; in the *Rime* (211) he writes:

> In thirteen hundred twenty-seven, I
> At the first hour, in April's sixth day,
> Entered the labyrinth, and lost my way.

And in the most precious book he owned, his Virgil, which is now in the Ambrosian Library in Milan, and for which he had Simone Martini paint a frontispiece, he wrote:

"Laura, illustrious for her own virtues and long celebrated in my poems, first appeared to my eyes in my early manhood, in the Church of St. Clare in Avignon, in the 1327th year of Our Lord, on the sixth of April, at the early morning service. And in the same city, in the same month of April, on the same sixth day, at the same first hour in the year 1348, her light was subtracted from that of the world, when I, by chance, was in Verona, ignorant, alas, of my fate. . . . As a memorial, afflicting yet mixed with a certain bitter sweetness, I have decided to make this record in this place of all places, which often falls under my eyes, that I may reflect that there can be no more pleasure for me in this life. . . ."

"Loving and grieving"

Who was Laura? No one is sure. We have Petrarch's words, but little else. She was beautiful, younger than Petrarch; she was married to one Hugues de Sade, an ancestor, it is thought, of the notorious Marquis, and she had a number of children—11, someone has said. She had, if we follow Petrarch, every virtue known as well as many only the imagination could invent. And it was, of course, that imagination and the poetic genius that shaped it which makes Laura's reality of interest. For 21 years Petrarch was to suffer—and enjoy suffering—his unrequited love for Laura. The results were his *Rime,* or *Canzoniere,* as they are alternately known; they include some of the greatest poetry of love, profane and sacred, that we know, and he worked on them for the rest of his life. One of the most revealing of himself, as man and as poet, is:

> Now put me where the sun's infuriate rays
> bring death to bloom; or where the ice and snows
> outmaster him; or where his chariot goes
> gleaming along serene and tempered ways;
> put me in Fortune's shadow or full blaze,
> under bright skies, or where the twilight glows;
> where the day rules; where nights untimely close;
> in age's ripeness; in green growing days;
>
> put me in heaven or earth or in the abyss,
> in vale or marsh, or on the hills upheaving;
> tethered to body, soaring free in bliss;
> obscure on earth or every fame achieving—
> I'll be what I have been, naught else but this.
> I'll live as I have lived, loving and grieving.*

But let us resume Petrarch's chronology. One needed patrons in those days, and Petrarch chose his wisely. He allied himself with the famous Colonna family, and during the next few years he often traveled

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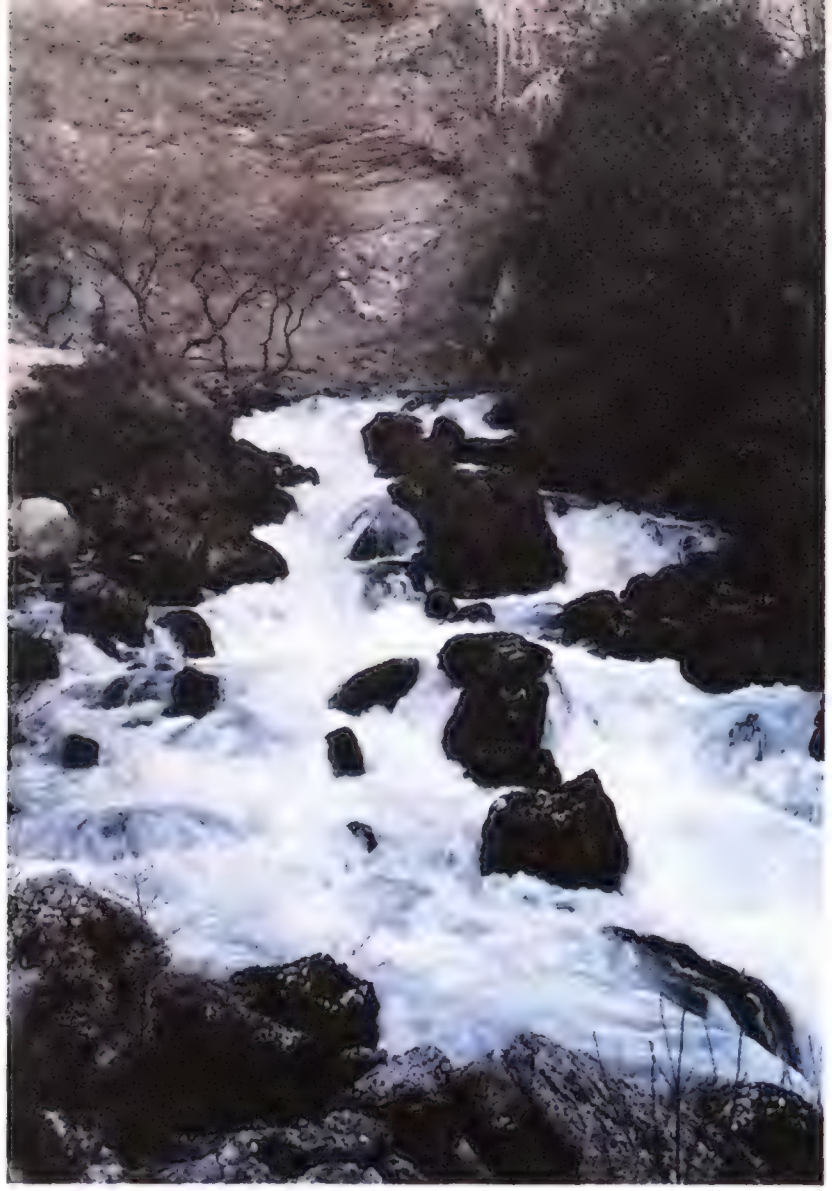


The famous Fontaine de Vaucluse, source of the River Sorgue, at which the boy Petrarch marveled.

Petrarch's study in Arquà. The bookcase and chair are supposedly part of the original furnishings.

for and with them. In 1336 there was another climactic event in his life, the ascent of Mont Ventoux, northeast of Carpentras.

Much has been made of this ascent and the fortuitous opening to a certain passage in the copy of St. Augustine which Petrarch always carried with him, for the event illustrates dramatically the modernity of his life and outlook, including the fact that he remains one of the first recorded mountaineers and certainly one of the first to climb a mountain "because it is there." He described what happened in one of his most frequently quoted letters:

"While I was admiring all these features, now recognizing some earthly object, now uplifting my soul, like my body, it occurred to me to look at the *Confessions* of Augustine. . . . (I keep it always with me, for the sake of the author and of the donor. It's of pocket size, but it contains infinite sweetness.) I open it, to read whatever may start forth; what but pious and devout words could start forth? Now by chance it opened to the tenth book. My brother stood intently by, waiting to hear what Augustine would say through my lips. I call God to witness, and my brother too, that the first words on which my eyes fell were these: 'Men go to admire the high mountains and the great flood of the seas and the wide-rolling rivers and the ring of Ocean and the movements of the stars; and they abandon themselves.'

"I was stunned, I admit. Asking my brother, who was eager to hear more, not to bother me, I shut the book. I was angry with myself for admiring the things of this world, when I should have learned long since from the pagan philosophers themselves that nothing is admirable except the soul, beside which nothing is great.

"Then, sated with sight of the mountain, I turned my inward eye upon myself, and from that time no one heard me utter a word until we got to the bottom. That quotation had given me enough food for thought, and I couldn't imagine that it had emerged by chance. I was sure that what I had read had been written for me and for no one else. . . ."

Shuttling between Italy and France

The next year he traveled in Italy, making his first trip to Rome. When he got back to Avignon, he bought a house in Vaucluse and announced his retirement, which turned out to be more of a retreat. In that same year, 1337, his son Giovanni was born; the mother is unknown. In Vaucluse Petrarch began his *Africa* and his *De viris illustribus*. In 1341 came the supreme moment of his life, the crowning as Poet Laureate on the Capitoline Hill in Rome. There was more travel in Italy, with a narrow escape from po-

litical enemies in Parma, the birth of another illegitimate child, finally a return to Vaucluse in 1345 where there was a period of intensive writing. The next few years found him wandering through northern Italy, before returning to Vaucluse in 1351 where he worked on the *Trionfi*. In 1353 he moved to Milan, and in 1362 to Venice, where he was given a palace by the Venetian Council and announced that this was where he would remain forever, only to move to Padua in 1367, where he stayed off and on for three years until he built a house in Arquà, a village near Padua; there he died on July 18, 1374.

Petrarch saw himself as living on the threshold of a new age of intellectual achievement, an age which he predicted would rival the great classical period of Greece and Rome which he revered. Never a modest man, he pictured himself as a prototype of the intellectual link between the historical achievements of the past and the promises of the future. Because he was also a man of his times, he turned to learning and scholarship as the only means of arriving at the truth, and from a very early age his admiration of and search for the great classics became almost an obsession. In 1346, Petrarch wrote to a friend, commissioning him to search for books:

"I have been largely, if not wholly, delivered from the burning of nearly every human desire by divine mercy. . . . But lest you think me innocent of every human failing, let me add that I am in the grip of one insatiable desire which so far I have been quite unable to control. . . . You will want to know what I am suffering from: books are the answer, and the impossibility of getting enough of them."

What Petrarch saw in his books was that for too long the great thinkers of the past had been suffocated by scholasticism. Aristotelian concepts, though they had much to offer, were too static and too cerebral—almost too logical; what they lacked was the movement and the dynamism which Petrarch believed could be found again by returning directly to the great writers and thinkers of the past. So convinced was he not only of the living quality of the work of

Petrarch's last home was this house in Arquà, near Padua, built with funds given him by a patron.

the ancients, but also of his equality with them, that he could write an extraordinary number of letters to the very greatest of those ancients, as if they were his contemporaries, approving or disapproving of their ideas, putting forth his own, and even berating them for their personal lives. It was a poetic conceit, of course, but it gave him the channel through which he could not only rediscover the legacy of humanistic ideas but reconstitute and reestablish them in his own time and with his own values.

When we think of Petrarch we think mostly of the poet, although he mistakenly believed that his renown would come not from his Italian poetry but from his Latin prose writings and, more than anything else, his "single devotion to the knowledge of Antiquity." Whatever he worked on, prose or poetry, he worked hard and long. There is in the Vatican Library a working copy of the *Rime* with Petrarch's marginal notes and corrections. One of them gives a fascinating glimpse of his working habits: "Amazing. This poem was once crossed out by me and condemned. Now, by chance reading it again after a lapse of many years, I have acquitted it and copied it and put it in the right place. Shortly afterwards, however, on the 27th, in the evening, I made some changes in the final lines, and now I shall have finished with it."

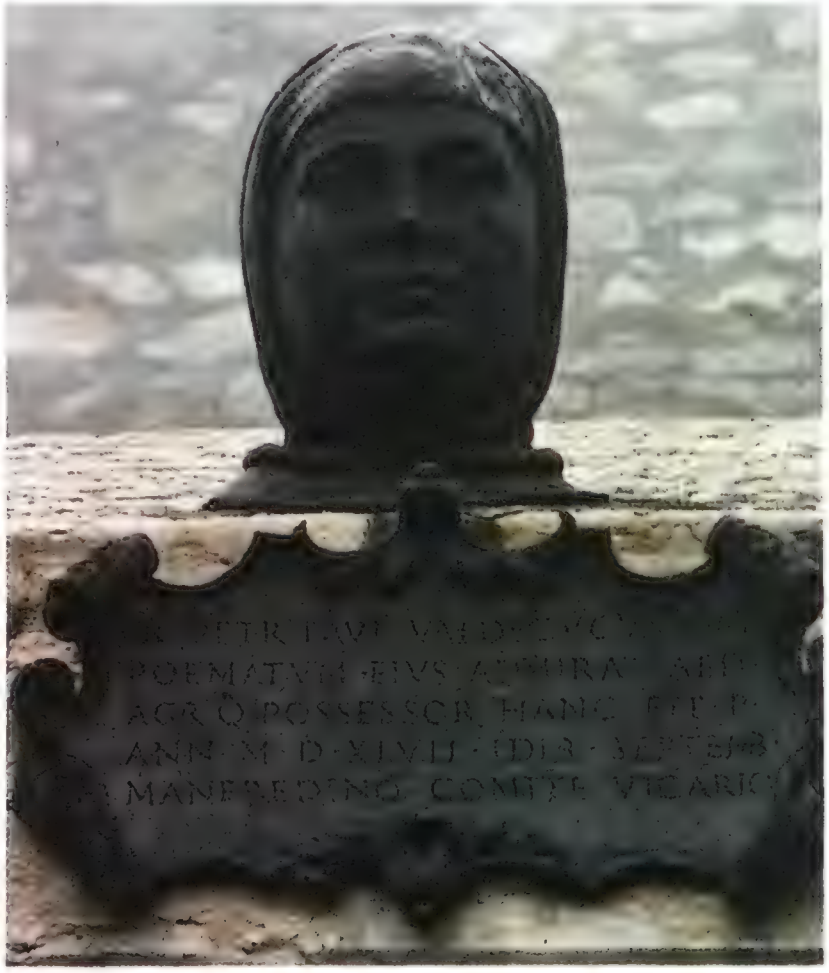
He made the sonnet sing

Petrarch was not a great student of antiquity aimlessly; he knew that whatever fame was to be his depended on the distinction of whatever he turned his hand to, and he was as anxious for the approval of his contemporaries as he was for that of posterity. The final collection of his *Rime,* rewritten, changed and revised continually, contains 366 poems—a number which is no mere coincidence, for there is a poem for each day of the year, and a final one addressed to the Virgin.

To say that Petrarch's poetry is beautiful is a ridiculous understatement; it is close to sublime. And it was in the sonnet that he found his best form of expression. He did not invent the form, of course—it had been around a long time and had flourished in the *dolce stil nuovo* which reached its climax with Dante. Petrarch, however, gave the Italian sonnet a glory it had never had before; he made it sing. The musical aspect of his poetry was important to Petrarch and a part of the troubadour influence upon him; another of his marginal notes says: "I must make these two verses over again, singing them (*cantando*), and I must transpose them—3 o'clock in the morning, October the 19th." And actually they sing very well, as anyone knows who has heard the versions which Palestrina set to music in the 16th century. This madrigal ("a sweet country idyll"—Bishop) sings in itself:

> Diana, naked in the chilly pool,
> brought no more rapture to the greedy eyes
> of him who watched her splashing in the cool
> than did my glimpse of a maiden unaware,
> washing a veil, the gossamer garment of
> her lovely and unruly golden hair.
> Wherefore, although the sky burn hot above,
> I shake and shiver in a storm of love.

Since Petrarch, love poetry has not been the same. The movement of Petrarchism zoomed throughout the Western world and in many ways still exerts strong influence. He set the model of what lyric poetry should be. His sonnets to Laura have influenced our entire culture. Petrarch's was the dominant lyric form for hundreds of years, but even more important was that the quality of consciousness which he realized in his poems to Laura moved and developed from love between man and woman to all kinds of experience. It was a quality of consciousness which was supremely original, it was individual, it permitted an entirely new framework within which one could respond to experience and live one's life—it was, in short, a Renaissance.



Bronze head, modeled after a portrait of Petrarch in Padua, rests on top of his tomb (opposite).

Petrarch's bones lie in this marble tomb in Arquà, built six years after his death by his son-in-law.

"I was waked up for the war! I was not headstrong,
but I was heartstrong—oh, very, very!"

By Fairfax Downey

Preacher Beecher and The Creature

Back when America's way was down the hatch, a militant minister, father of Henry Ward and Harriet Beecher, fought the almighty bottle

A challenge to a duel was issued in a church at East Hampton, Long Island, one Sunday morning early in the 19th century. The challenger was the minister in the pulpit, the Rev. Lyman Beecher, and the adversary he defied was called, oddly enough, "The Good Creature of God."

Rum was The Creature. Its title had been conferred by the Puritans because of its benefits and comforts when taken in moderation. But few Americans indeed were taking it that way. Hence the Rev. Mr. Beecher's quarrel with The Creature and all its works.

" 'Woe unto them that are mighty to drink wine, and men of strength to consume strong drink!' " the preacher thundered. And none could accuse him of throwing down the gauntlet in the absence of his opponent, for The Creature was present—on the breaths of members of the congregation who had downed their regular eye-opener before the service.

After the sermon, startled parishioners streamed homeward, buzzing with excitement. Rarely had The Creature been so roundly and publicly denounced. It could fairly be said that their minister was engaging in a duel where not many would offer themselves as seconds. The first American temperance society had been organized only a little earlier, and, in the phrase of a later day, it was getting nowhere fast.

The Creature was present, even among worshipers who had downed eye-openers before the service.

Drawings by W.B. Park

No less excited than his flock, Beecher retired to his parsonage. The father of 13 children (including Henry Ward Beecher, also to be a noted clergyman, and Harriet Beecher, who as Mrs. Stowe would write *Uncle Tom's Cabin),* he usually took things as they came. But at times he became so overwrought by the magnitude of the campaign he had begun that he was compelled to resort to various devices for restoring his equanimity. He would descend into the cellar and shovel a pile of sand back and forth. He would play *Go to the Devil and Shake Yourself* on his fiddle. Finally, he would remove his shoes, smile at the holes in his socks and dance a double shuffle in the parlor. Only then did he feel restored.

Down in his cellar, Beecher would shovel sand and play *Go to the Devil and Shake Yourself* on his fiddle.

"Kill-devil" at ministers' convocation

Contending with The Creature was, Beecher understood, as unpopular a crusade as he could have chosen. Most Americans, regarding liquor as a blessing, mixed or unmixed, drank hearty. They downed incredible quantities of rum (alias "kill-devil"), of whiskey, wine, beer, gin, cider, brandy—along with fearful compounds. They quaffed copiously, steadily and widely—women, children and even babes in arms not excepted. Never at a loss for a motive or an occasion, they drank to seal a bargain, raise a barn, cheer the gloom of a funeral and even to ordain a minister. Nor were the clergy by any means abstainers. Beecher recently had attended a convocation where men of the cloth partook of spirits until, so he said, the room looked and smelled like "a very active grog shop," with hilarity banishing all decorum.

Liquor was plentiful and cheap. Many an American household had its still, its brewery or its press. Scottish and Irish immigrants distilled whiskey from barley, potatoes, corn, or anything else distillable. Thirsty, thrifty and ingenious, the settlers extracted liquor from barks, roots and leaves. Nearly all the bountiful yield of apple orchards was pressed into cider. The destiny of peaches, pears, cherries and other fruits was to become brandies and "bounces." Bees aided and abetted, not only pollinating fruit blossoms, but by furnishing honey for making metheglin, or mead; that potion was also compounded from the bean of the honey locust, whole plantations of the trees being cultivated for the purpose. It might not still be true, as the Rev. Increase Mather of Boston once affirmed, that the poor and ignorant could make themselves drunk for a penny, yet it cost little more. Rum, the foundation of the slave trade and of the fur traffic with Indians, and the mainstay of the cold, wet fishing industry, cost less than a dollar a gallon, with whiskey about the same. It was estimated that in this year of 1810, 14,191 American distilleries would produce 25 million gallons of spirits.

Accounts of a Massachusetts town of 3,000 showed that in 1802 it spent $7,370 on schools, roads, minister and so forth, but on rum, brandy and gin $15,560; the price of rum was then 61 cents a gallon. A typical tavern was compelled to install a sliding grating, like a castle portcullis, in front of its bar for protection against the press of drinkers. The pioneers, liking their liquor as violent as their life, favored a tipple called squirrel whiskey—after three drinks the imbiber was said to rush out and climb a tree. Thirsty scouts and trappers, drunk as owls but still steady, were given to shooting tin cups, brimful of whiskey, off each other's heads. Lusty timber cutters added red pepper to their spirits to make the stuff really cut when downed, or nailed a plug of tobacco in the bottom of a whiskey keg before refilling to lend potency. Lonely planters in their isolated manors welcomed chance travelers and offered hospitality that gurgled. At every farmhouse cider was free to all passersby, including tramps.

The Rev. Mr. Beecher was disturbed that women,

A longtime military historian, Fairfax Downey has 45 books to his credit and is at work on another. He relaxes by tending his New Hampshire tree farm.

though more temperate, joined men in the steady, heavy drinking. In 1714, 17 out of the 41 liquor sellers in Boston were themselves women. But the minister was fairly appalled by the extent to which children were given not only fermented but distilled liquors. Babies arrived in an alcoholic atmosphere. While their mothers were in labor, "groaning beer" was served relatives and friends gathered for the event. No child was considered properly christened until all present had drunk to its happiness and acquired not a little of their own. A temperance tract lamented that "under the Greek name of Paregoric, rum doubly poisoned with opium quieted the infant's cries."

From the great mugs of flip prepared nightly for adults, children were given a sip to keep them warm while getting to bed in wintry rooms. However, many parents were inclined to heed the almanac's warning that "very young children must not drink cold drinks but must have their beer heated, and must first eat a piece of brown bread before drinking beer or wine."

It was not to be wondered at that Lyman Beecher began insisting that children should be taught early the dangers of intemperance. "I do not remember," he said, "that I ever gave . . . a child a pittance of money to be expended for his gratification, unattended by the earnest injunction not to drink ardent spirits or any inebriating liquor."

He never "gave a child a pittance . . . unattended by the earnest injunction not to drink ardent spirits. . . ."

When accustomed nips were denied them, some youngsters complained bitterly, as did a miss of seven, come from Barbados to visit her grandmother in Boston. When she was given only water to drink, she left the house in high dudgeon with her maid and wrote home indignantly. Promptly arrived a letter of remonstrance from her parents, advising the temperate grandmother that Missy always had been brought up as a lady and must have wine and beer with every meal.

A distressing case was that of Professor Calvin E. Stowe, future husband of Lyman Beecher's daughter Harriet. The professor confided that as a lad of four he got drunk as a lord from sampling the cherries discarded by his father after making cherry bounce. Next he stole rum from the farmhands and got tipsy again. At six he went to live with his grandparents, who invariably took a dram at eleven and four o'clock every day and gave him one.

Whenever a doctor was called in, he was likely to recommend an alcoholic stimulant, and it was good manners for the patient's family to offer the physician a dose of his own medicine. Liquor was a favorite prescription, whether the ill were aged, infants or in between, and their ailments colic, vapors, chilblains or snakebite. Unfortunates about to undergo an operation were given their choice of anesthetics: a stunning blow on the head or soothing and sustaining swigs from a jug of whiskey. Not unnaturally they usually elected the latter.

Libations were poured on every business transaction from the signing of a contract to the sale of a farm. No grocer could prosper unless he kept a barrel of liquor on tap and treated his customers when they paid their bills. General stores listed dry goods in contrast to wet and stocked far more of the second kind.

Scouts and trappers, drunk as owls, shot tin cups of "squirrel whiskey" off each other's heads.

No farmhand, sailor, laborer or artisan would work without his quota of The Creature. Wages included a daily allowance of rum, and few workmen would accept more money in lieu of the liquor. At harvest time the meeting-house bell was rung at eleven and four to call hands in from the fields for the customary dram, simultaneously being hoisted by men, women and children throughout the land. A barrel of rum stood at the gate of the Medford, Massachusetts, shipyard; shipwrights paused for a dipperful on their way to work and again for another on their way home.

When the old fort at Albany, New York, was rebuilt in stone in 1656, every stage of the construction was accompanied by wholesale wassail. Besides a daily allowance of one dram of brandy and three pints of beer, a workman received special treats for his particular job—a tun of strong beer for the wreckers, a case of brandy and 33 quarts of whiskey for the masons, a half-barrel of beer per beam for the beam carriers. On completion the toilers demanded a spree for themselves and their wives but were refused. The building was christened—rather superfluously—by breaking a bottle of rum on it.

Defying the might of custom, Mr. Beecher excommunicated members of his Litchfield, Connecticut, church who became addicted to drink. He launched his *Six Sermons on Intemperance* which were acclaimed not only in New England but westward and in Europe. "I was waked up for the war!" he later recalled. "I was not headstrong, but I was heartstrong—oh, very, very!"

There was no lack of ammunition for his war. The not infrequent deaths in the harvest field, where laborers took their tots daily, could be ascribed to something other than the effects of heat or fatigue. When workmen at barn raisings fell from the scaffolding and were killed or injured, people could not help glancing from the body to the rum barrel customarily broached. Strong drink prompted many a sword or pistol duel. It was not water that engendered the enthusiasm of county fair free-for-alls and tavern brawls where heads were cracked, ears bitten off and eyes gouged out. Temperance exhorters, who declared that most Indian wars were caused by the use of liquor as trade goods, might be said to be going too far. But none could dispute the figures from the poorhouse that a large and increasing proportion of the paupers admitted were perceived to be sots.

Some signs of victory did indeed appear to the hopeful gaze of Beecher and other temperance crusaders. In New Hampshire a farmer announced a barn raising where only lemonade would be served, and in spite of much doubting the barn went up.

But the time was not yet. The doughty Beecher was forced to admit that in the end "the democracy, as it rose, included nearly all the minor sects, besides the Sabbath-breakers, rum-selling tippling folk, infidels, and ruff-scuff generally, and made a dead set at us of the standing order. . . . They slung us out like a stone from a sling." He did not live to see Demon Rum take a presumed knockout blow from the 18th Amendment and come back up fighting.

Still and all, the cocktail hour of today isn't The Creature of Beecher's time—not by many a jugful.

"Under the Greek name of Paregoric, rum doubly poisoned with opium quieted the infant's cries."

Rumor has it William the Conqueror stocked up in our supermarkets.

He knew a good thing. Silks and spices, gold, ivory, peacock feathers. And the beautiful bargains are still to be had. In places like this—the market in our walled city of Harrar. Arab traders first came here in the 7th century.

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The Key to the Hidden Empire

By Robert I. Gilbreath

A kind of *Eriogonum*, seen here actual size

Tracking desert's tiniest flowers

Short-lived miniblooms of the arid West, first seen only by accident, have kept one amateur busy—and prone—ever since

Three years ago, on the lip of Luna Crater in south-central Nevada, about 100 miles southwest of Ely, I noticed a fungus approximately three inches tall growing out of the rock and sand. I had always thought fungi (toadstools, mushrooms and the like) grew only in shady damp places. Yet here was one in, of all places, an arid desert in Nevada.

I had been photographing fungi for years and could not pass up the chance of getting a picture of this one, bravely erect, with its black hair neatly parted in the middle. While photographing it, I accidentally dropped the lens hood. Leaning down to pick it up, I noticed that the ground was covered with tiny plants. On the plants were white specks which were flowers. So I took a picture using the full set of extension rings that give a reproduction of 1:1. In other words, the image on the film would be the exact size of the plant and flower.

When my wife Katharine and I returned home and had the film developed, I projected it on the screen and, to our amazement, it showed an exquisite white flower about 1.5 millimeters (or 1/16 of an inch) in diameter with six petals striped with pink, complete with pink-tipped stamens and a yellow pistil. There had been thousands upon thousands of tiny flowers on ground that we had walked over many times without ever seeing them.

This started me thinking that there must be other flowers in the desert so very small that almost no one ever notices them. No one, except a particularly dedicated botanist (or photographer), would creep about the desert on hands and knees. I decided that I would have a go at finding and photographing these flowers, and set about acquiring the necessary equipment—and learning how to use it.

I added a bellows, a lens-reversing ring and a 35-millimeter lens to my equipment before we set off on another trip into the desert. After days of travel and many hundreds of miles, we finally found another flower in Snow Canyon in the southwestern corner of Utah. I found it only by the shadow its long, thin, wiry stem cast upon the ground. Its leaves were barely above the ground and were almost too small to be seen. Here, finally, was the opportunity to try my new equipment—but I could not locate the flower in the viewing screen! Eventually, I did find it, but the flower was bobbing (from air movement that I could not feel) so much that I could not focus. About midday the air currents subsided, and after four hours of lying in the desert sun I had a few pictures which I felt sure would be no good, but I did know that I had a lot more to learn and that more equipment would be necessary for future miniflower photographing.

Winter was coming on and we would make no more trips that year. I acquired more equipment and spent the entire winter trying to learn how to do what it was that I was trying to do. The whole question of lighting became a matter for experimentation: Use various flash settings, take pictures, inspect them, adjust the settings and take more pictures. Seventeen weeks and 720 slides later, I had produced a complete set of tables for flash settings.

Focusing must be precise

Back in the field the next spring, other problems reared their heads. With the bellows fully extended, I think it likely that the depth of field is no more than 0.5 millimeter. Focusing must be precise, and readjusted after each picture because of the possibility that the camera has moved. Merely tightening the adjustments can wreck the focus completely. And the flower keeps following the sun, which frequently makes it necessary to move the equipment and start all over again. (Nor is inadvertently kicking the tripod while pausing for a bit of rest at all helpful.)

Most of these flowers are extremely fragile and cannot be disturbed in any way; they can usually be pho-

In the tradition of mad dogs and Englishmen, author defies Death Valley's heat and peers through his lens at a miniature blossom. It takes three hours to get a series of pictures of one "belly" flower.

tographed only where they are growing. Sometimes they can be taken from the ground, placed in a glass filled with sand and water, and then photographed in my camper. But it is discouraging to watch a flower wilt even as it is being photographed, and it is dismaying to project a picture on the screen and find a petal that has started to turn brown from "old age."

After I had found and photographed five or six flowers and had the pictures enlarged to 8 by 10 inches, I began searching for someone who could tell me what they were and found Ira L. Wiggins, Professor Emeritus of the Department of Biological Sciences at Stanford University and an authority on the flora of the American and Mexican deserts. The pictures delighted him. Some he could not identify to species level from the flower photographs alone, and he told me that if I were going to persist in this venture, I should bring him pressed and dried specimens of the plants. And he cautioned against too long an exposure to the high temperatures and low humidity of the summer desert habitat. In Zion National Park I once spent five hours on the ground photographing only one flower. Later that evening a park ranger told me the temperature that day had been 105.

Professor Wiggins thinks there is a slight possibility that we may find some flowers that are not known—an enticing thought.

From what I have been able to learn, miniflowers are to be found in all parts of the country but they seem to be more abundant in the deserts and semiarid areas of the West and Southwest. There is an evolutionary advantage in reducing the surface of leaves, stems and other parts of plants growing in desert habitats. This reduces the amount of water lost through transpiration, so that under conditions of high temperatures and scanty water supply small plants have

In addition to pursuing little flowers, Mr. Gilbreath helps The Nature Conservancy by traveling the desert to photograph potential sites for acquisition.

a decided advantage over those with larger leaves. Furthermore, very small plants use less energy to bring about germination of seeds before the available water supply is exhausted. In contrast, large annual plants might be killed by drought before they could even reach the flowering stage, let alone cast their seed. In this case, the laws of "survival of the fittest" may favor plants of small stature.

We have found miniflowers in a variety of locations —in the mountains of Wyoming, where there is considerable rainfall, in my own garden in the coastal range of northern California, and at elevations ranging from 150 feet in Death Valley to 8,500 feet in the semiarid mountains of Colorado and Utah. We have never found them in any area that has been cultivated, but we do occasionally find them where the ground was disturbed long years ago by a road grader.

Some grow on plants no more than 3 millimeters tall and others may be found on single-stem plants and on bushes about half a meter in height. Many grow close to the earth and blend into it so well they can scarcely be seen. Others are on very thin translucent stems and can be found most readily by looking for their shadows. Plants that look as though they were dead sticks may be covered with blossoms, and still other flowers are so deeply buried among dense, short, spiny leaves they appear to be grains of sand. Some are single flowers, some blossoms are in clusters almost too small to be noticed, and others grow so close to the stem that I have wondered if they really were flowers. All must be found and inspected with a powerful magnifying glass, and we have learned that when a flower is found, it must be staked out immediately or we may never find it again. A ring of stones or an upright stick will do. Lately we have discovered that metal stakes with ribbons attached make good markers.

Late one afternoon in Nevada we were looking for a reasonably level spot where we could spend the night, and found an area of several acres of gravelly soil that was suitable. As usual, we started looking for flowers and, on close examination, we found the ground was covered with thousands upon thousands of two varieties, along with two more varieties that were not so profuse. After crawling about on hands and knees with a hand glass, I estimated there were between 150 and 200 blossoms per square foot of the

An array of miniflowers (note the point of a common pin in third photograph as an indication of size):

from left to right, the tiny blossom of Western stickseed with an even tinier insect crawling

area. There were so many that we did not bother to stake out any of them. The next morning I set to work and photographed two of the varieties but, despite our most careful efforts, we could find no trace of the other two—one red, one blue.

In Utah, at Capitol Reef National Monument, I found and photographed a bud as it was opening and got a series of pictures of this event. We left to go to another location, and when we returned to the exact spot three days later there was no trace of the flower. We spent some time in Chaco Canyon in New Mexico. While it rained all one day I photographed flowers in the camper. Katharine took a walk in the rain and found some beautiful yellow flowers, about the size of the eraser on a pencil, growing on what appeared to be old, dried sticks. Because of the rain she could not take a picture that day and waited until the next—but by then they were gone without a trace. Only the old dried sticks remained. The blossoms had lasted only one day.

Professor Wiggins told me it sometimes happens that a flower will appear one day and be gone the next, although another may be found near the same spot. A botanist can spend a lifetime studying desert plants —there are roughly 3,000 species—and never see the flowers of all of them. He must be there searching at the exact time one blooms.

The ephemeral nature of many of these little flowers and the extremely harsh and remote terrain in which some of them grow account for so relatively little being known about certain species even by the most dedicated of botanists. As is the case with bigger desert flowers, these little flowers do not bloom every year. Indeed, they may wait for many years until the temperature and moisture conditions are exactly right before they bloom again. The seeds of desert flowers are "timed" to germinate at different intervals to adjust to droughts of varying durations. Because of exceptionally heavy rains during the winter of 1972-73, the Mojave Desert saw the "year of the flower" in 1973. Naturalists were sent scurrying to their reference books to identify flowers that had not been seen for many years.

During my efforts to photograph these little flowers I found another subject that was equally fascinating—the insects that crawl down into the flower to pollinate or feed on it. The first one I saw was in an enlarged print: I could not believe it, but there it was. Since then I have seen many of them while looking through the lens of the camera but, sad to relate, I have photographed only two while they were in the flower, plus another that was resting on the point of the pin I try to place in each picture for scale. All by happenstance. The one insect I wanted most to photograph was a wasplike insect I saw in Death Valley. While I was trying to focus, it landed on the flower, delved deeply into it and flew away. The length of the insect was about one-third of a millimeter. My methods are too slow for this sort of thing.

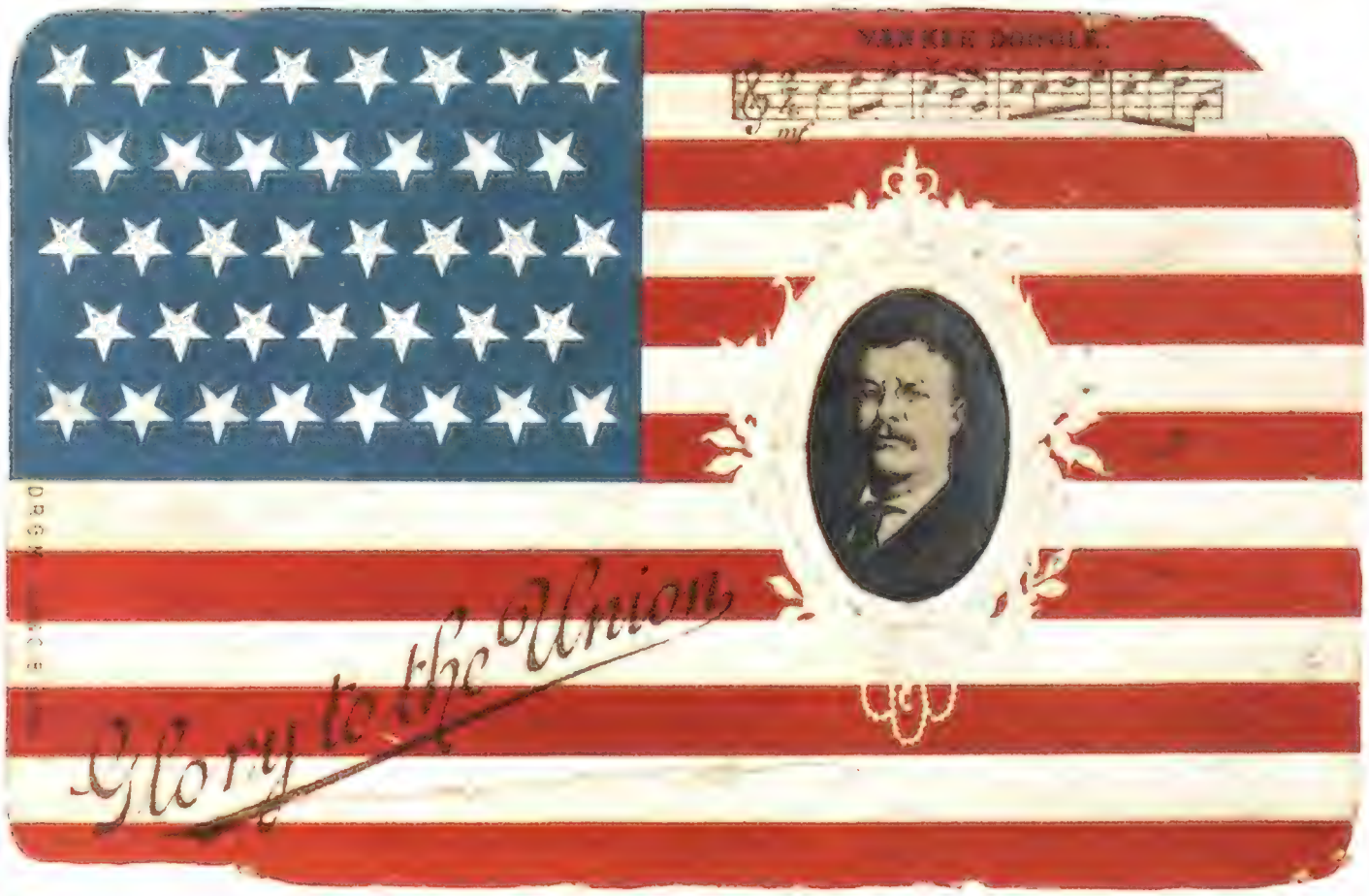
After such a session I am ready to drive off and throw the equipment in a dry wash, or give it to the first person I see. Then, having rested and recovered a bit, I again feel the urge to have another go. But first I have to find the flower.

on it; the delicate flower of Thomas' wild buckwheat; Siberian smelowskia, a wide-ranging member of the mustard family which is found in rocky areas; and a cluster of bracted vervain, a species of verbena.

First postcard, Austrian *Correspondenz-Karte,* appeared in 1869.

This emancipation card was printed in 1908 . . .

. . . when a girl's ankle was worth a postcard joke.



Patriotic card of 1902 has Teddy Roosevelt's picture.

By J. Timberlake Gibson

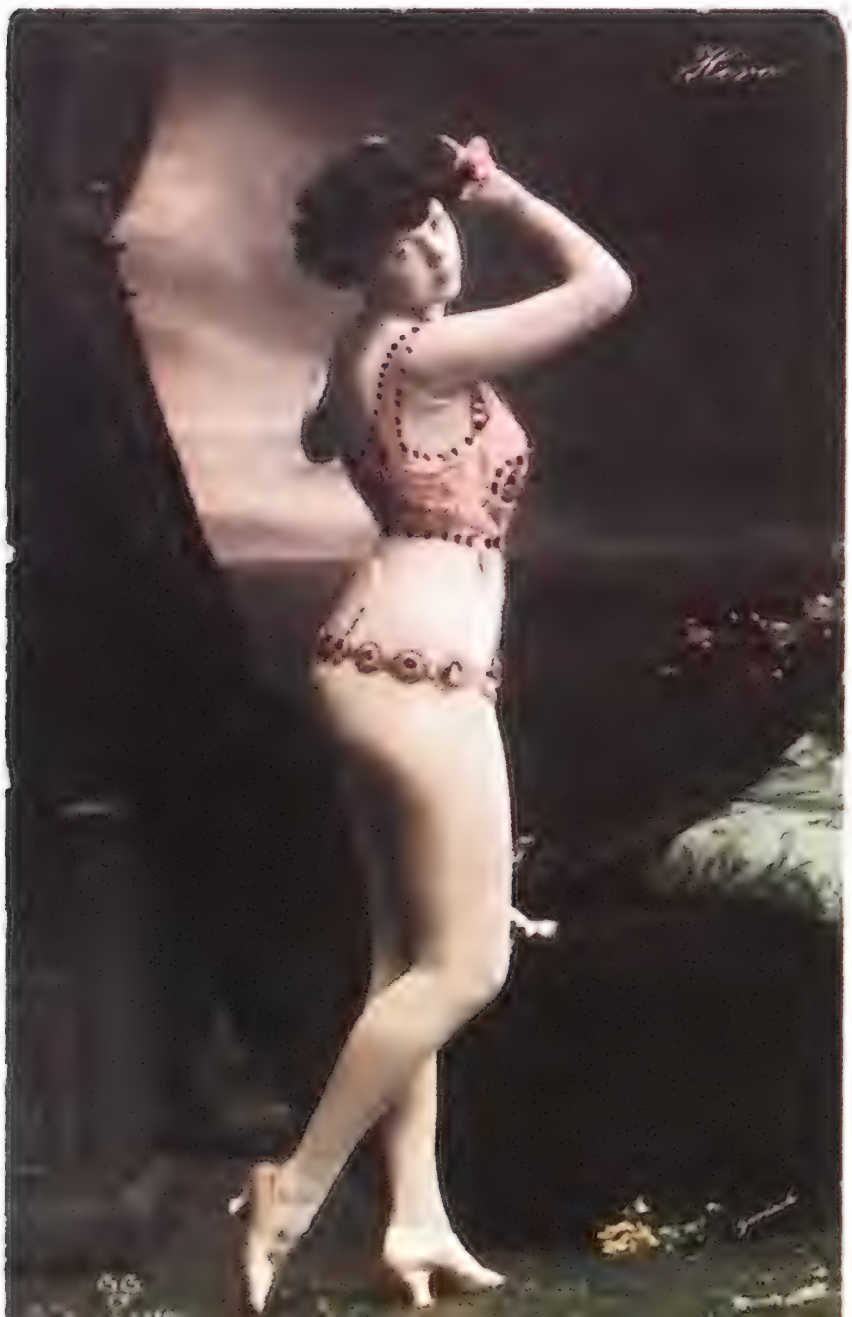
Story of postcards goes back a century

'Having wonderful time, wish you were here' has appeared on the back of art, propaganda and bathroom smut—all now collectors' items

Dr. Emanuel Herrmann is not exactly a household word, but perhaps he should be. A young professor at an Austrian military academy, he felt that the mail service of the 1860s was expensive, and that most letters said in two pages what could be said in one. He designed a thin envelope-sized cardboard (opposite, top)

Flapper thumbs nose at the moon on German card.

DANZA MACABRA N. 9 LIT. LONGO - TREVISO



which would weigh less than a letter. Herrmann argued that decreased weight would result in more efficient service. For those who distrusted brevity or open mail, letters still remained any man's option.

The Austrian Postal Service liked the idea. On October 1, 1869, the first official postal card *(Correspondenz-Karte)* appeared—a thin, buff-colored slice of cardboard imprinted with a yellow two-kreuzer stamp—cheaper than the five-kreuzer letter rate. On the stamp side was the address, on the reverse a space for a message. In three months, some three million were sold. Soon Germany and Great Britain introduced similar cards, and on May 13, 1873, the United States issued its first official postal card—buff, imprinted with a one-cent stamp showing the head of Liberty. Cost: one cent. About 31 million were printed.

Early postal cards were stark and utilitarian, but by the 1890s they were embellished with colored borders and views of cities or famous people. Dr. Herrmann's card had merged with earlier ideas—the propaganda envelope, the ornate, sentimental valentine and the *carte de visite*—to produce graphics which were art forms in their own right.

In 1894, Private Mailing Cards (non-governmental) were authorized in England with no rein on creativity—views of natural grandeur, palaces, political propaganda, commemorative paeans and cartoons, color reproductions of the old masters. In 1898, the first Private Mailing Cards were issued in the United States. The postcard had become the rage of two continents. A contemporary journalist described the fad as reaching epidemic proportions. Every Victorian parlor had an album bulging with postcards—the more flamboyant and "foreign" the better. Here was a status symbol showing the sophistication of one's friends (and, therefore, of oneself).

Yet there were many who hated postcards because they violated privacy. When the erotic card, with or without redeeming social value, made its appearance it gave ammunition to the cardphobes. Those outrageously curvy females in their diaphanous finery—or lack of it—must be stopped! So underground they went to become "filthy postcards."

By 1914 the postcard craze began to wane. World War I created severe shortages of materials among German printers. However, cards remained a prime means of communication, especially for American

A deltiologist as well as free-lancer, Mr. Gibson described the Lafayette Escadrille in December 1972.

"Checkmate to the Kaiser!" reads the propaganda card above. German "filthy postcard" needs no words.

soldiers. They didn't have much time to write, and here was a way to send a quick message and show the folks back home how it was over there in oo-la-la-land. The French were not averse to printing mountains of the cheapest, most vulgar products to oblige. After the war, there were such new titillations as radio, more and better movies, cheaper and simpler cameras to snap yourself. The grand days of the postcard were over. The glorious pre-1915 cards are now "antiques."

But like Confederate money, the postcard has staged a great resurgence, riding the crest of the current nostalgia boom. In the United States there are now more than 100,000 collectors—or deltiologists (*deltion*, Greek for small writing tablets). The number of subjects is so enormous that serious collectors specialize, unless they wish to add a wing to their houses. Railroad stations, disasters, state capitals, flowers, dolls, aviation and royalty are especially popular. Many collectors prefer a thematic approach. For instance, the Prints and Photographs Division of the Library of Congress has a collection of some 30 albums belonging to the late Richard J. Pahnke who specialized in taking tours by postcard. One jaunt starts at Bangor, Maine, and terminates in Long Key, Florida. Along the way we get a bird's-eye view of the Charles River in Boston and the fairgrounds in Worcester, Massachusetts. One flip of the wrist, and we're at the waterfront in Newport News, Virginia. After a sojourn of one second at the De Soto Hotel in Savannah, Georgia, we hasten to

Post-World War I "flaming youth" era made much of a girl's freedom to smoke cigarettes.

This 1908 postcard takes its theme from the words of a popular sentimental song of the day.

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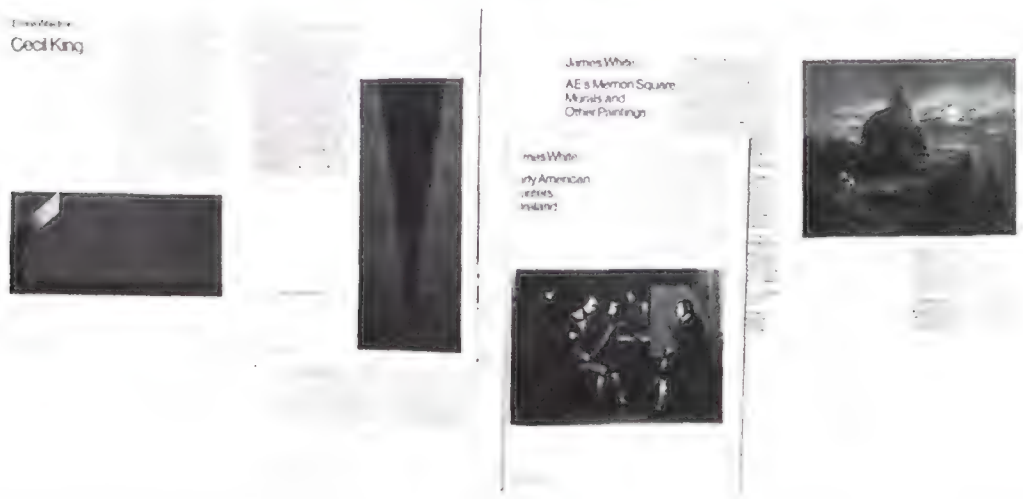

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Gilt-trimmed card is postmarked 1907.

Jacksonville, Florida, with many pauses between for glimpses of more cities, rivers and related scenes. Beats air travel, and we get just about as much out of it.

The Smithsonian's Division of Postal History contains fine examples of post-cards used as political propaganda. No one, back in World War I days, was surprised to see the Kaiser depicted as a toad or President Wilson as Sir Launcelot.

Post-World War I cards were often of poor quality—boring views of small town Main Streets no longer had their former rich color and heavy embossing, but they still sold because they saved people time

"Glorious Fourth" souvenir is also embossed.

and money. Today, even these inferior mementos are eagerly sought as lasting records of how it was—be it ever so pedestrian. A few manufacturers continued to hire good artists and turn out attractive and colorful cards. Raphael Tuck & Sons of London, whose "Oilette" series add charm and importance to any collection, have clung to their traditional standards.

What determines the value of postcards to collectors? Condition, quality, historical association and, naturally, demand. The most costly card was produced by an Indian prince in pure ivory. One assumes it was hand-delivered. The Jap-

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Photographs by Cornell Capa

Text by J. Mayone Stycos

Latin American overpopulation shoves thousands to margin of life

A look at Central America's grim catalog of disease and malnutrition, ignorance and despair—the result of urban growth

Photographer Capa, head of the International Fund for Concerned Photography, teamed with Dr. Stycos, director, Cornell's International Population Program, to produce Margin of Life *from which this is excerpted. It will be published by Grossman/ Viking this month.*

Maternity patients who have just given birth (or, more likely, aborted) learn hygiene from a film.

1974 is World Population Year. Out of the scores of U.N. sponsored meetings culminating in a world conference in Bucharest in August, at least one conclusion will emerge: Population problems are intimately bound up with poverty problems. But what seems so obvious as a generalization is not so simple to demonstrate in the particular. Cornell Capa and I decided to try.

In order to illustrate how poverty and population growth comprise an ever tightening circle around the lower income residents of less developed countries, we visited two small nations in Central America—El Salvador and Honduras. We wanted to see, after almost a decade of the Alliance for Progress, how the joint squeeze of rapid population growth and sluggish economic development was affecting the individual.

In these excerpts from our book, we have chosen several of the crucial ingredients of modernization—health, housing, education, family planning and female employment—to illustrate the steady erosion of the quality of life in El Salvador. To understand what is happening there is to go a long way toward understanding what is happening to the poor in many of the world's most rapidly growing countries.

Toward the middle of this century Latin Americans began to move to the cities. Initially the large landowner felt no labor shortage because the rural labor force continued to grow. For the industrialist, the abundant labor force meant that the wages could be kept low for both the factory worker and the domestic servant, not to mention the multitude of shoeshiners, car washers, package carriers and messengers. Indeed,

Shack outside Santa Tecla, where three generations live in squalor, stands on a strip of public land.

life would have remained idyllic but for several facts. First, as old slum areas became inadequate to house the new poor, migrants began to invade peripheries. Paying exorbitant rents in town was one thing; erecting one's own shack and living rent-free out of town was "invasion." Second, industrialization for the most part never blossomed. What began as a delightful labor surplus became a glut of unemployed. Moreover, once turned on, the urban migration could not be turned off. Long after the demand had been exhausted, the rural supply continued to march in.

Almost a decade after bold housing goals were established by the Alliance for Progress, a report on housing in Central America termed the situation "truly alarming." In El Salvador, although three percent of the government's budget is allocated to housing, the government admits it is merely scratching the surface. As a report put it: "In the urban area, population increase and replacement alone require 28 new houses per day, but no more than eight are being built." Such houses, moreover, are beyond the financial reach of many urban residents.

Private enterprise, in addition to providing housing for the middle and upper classes, also provides a kind of housing for the poor. It is a horizontal version of the tenement, termed the *mesón* in El Salvador. By packing many families into a small space and providing a few utilities, the landlord can make a handsome profit from even the poorest populations. Surveys conducted in one *mesón* showed about 290 families paying 40 cents each per month for the use of a single water fountain—a total of $116 per month. Close to two-thirds of the salaries of the adults are under $40 a month and more than a quarter earn less than $20 a month.

Of special interest is the sewage problem. Of 220 families interviewed, only 42 had their own latrine and 26 had access to a neighbor's. Thus about 70 percent have no access to a latrine. The Department of Health survey notes with concern a decline in latrines, explaining that "the proprietors obliged the renters to dismantle their privies because they rent the land to build shacks [*champas*], not toilets. He who wants a toilet should pay for the land it occupies."

A community of 1,500 people with only about 50 latrines generates some pretty strong smells—so strong that the middle-class neighborhoods around Las Serpas have been complaining. This may be one poor community that gets rapid help from government!

When a dysentery epidemic broke out in El Salvador's department of Chalatenango, we were eager to visit the hospital to get a notion of rural health problems. Chalatenango is a heavily populated, arid and especially poor zone bordering Honduras. A medical report on the region had described it as "wild and ill-suited to much agriculture. The population which shows up at the clinics evidences severe malnutrition of all kinds, and intestinal parasitism is widespread."

The 48-bed Chalatenango hospital serves a population of 163,000. Its occupancy rate exceeds 100 percent because there is often more than one person per

Maria Cristina, shoe vendor's helper, guards her small daughter, asleep in her bedroom—a box.

bed. In pediatrics, we picked our way around bloody diapers on the floors, being especially careful not to disturb the flies. Our attention was caught by a child who kept trying to stand in his crib and kept falling down and crying in dismay. We commented to the nurse on his apparent malnutrition and she cheerfully lifted him out for a picture. "Most of them here are undernourished," she said, "and only partly because of the dysentery. Their parents don't even know they're undernourished; some of them think these big stomachs mean the child is healthy. The main cause of their malnutrition is the ignorance of their parents, who sell the best food they grow instead of giving it to the children."

We turned to another child with swollen legs and genitalia and asked the doctor if he knew the cause. "Not really," he said. "Third degree malnutrition case—underweight by over 40 percent. Because of the tremendous pressure of cases we can't really treat the basic causes. Anyway, the doctor can't solve this problem; it takes the economist, the industrialist, the lawyer. It's true that education is part of it—there are women who sell their hens' eggs rather than feed them to the child, then use the money to buy him a straw-

Student demonstration depicts American soldier stabbing "Aid for Latin America" in the back.

Migrant workers at roadside form "people's market" as they wait for plantation foremen to hire them.

berry-colored soft drink because they think it will fortify his blood."

We urged the doctor to tell us about the demands on his tiny hospital. "Recent governments have put in roads and public transportation . . . to facilitate the transport of agricultural goods, but it's had the effect of bringing in the sick to the hospital. The number of sick is the same, but the doctor sees more of them now. They used to die and who knew about it? Three years ago this child would never have come here because there was no road and no bus."

In rich countries we worry about the high school dropout. In poor countries like El Salvador the concern is for the grade school dropout. For every 100 students in the first grade in 1967, 80 failed to graduate from the sixth. Even in the city schools there are almost four times as many students in the first grade as in the sixth.

The urban dropout rate is in large part explained by the need for cash. The deficit of boys begins in the fourth grade, when the average child would be 11 or 12—an ideal age for selling papers and Chiclets or guarding cars. The child can bring in a few pennies a day—enough for a stick of firewood or a pot of coffee. An example taken from one principal's notebook gives the flavor: "Norma Angelica, fifth grade. Irregular attendance from the beginning of the year. Now a vendor in the market. She hardly remembers school and thinks only of what she's earning."

Maria Cristina is a 31-year-old working mother. She had her first child at 14, and has had six more, two of whom have died. With no husband and now with three children between the ages of two and ten to support, she survives by helping a street vendor sell shoes. Since he has only a dozen pairs or so to sell, he often fails to suit the customer, so Maria runs to other vendors around the market, seeking the appropriate size. If she finds the right ones she earns a commission of four or five cents.

Since there are not many customers per day, Maria could not keep up the payments of $10 per month on a rental room. After falling a year behind in her payments, she decided to leave and, two years ago, then with five children, took up residence on the street. A small platform used in the day for selling vegetables is her floor, and by a clever arrangement of boards and a sheet of plastic she assembles a box on the sidewalk for her family each night. Maria has a large club to discourage drunks, especially from approaching her five-year-old girl.

Even rent-free, she found it difficult to support five children, and soon sold or gave away her 13-year-old girl to a Nicaraguan woman who will probably train her as a prostitute. The other children have had to discipline their minds and stomachs to nutritional irregularity. Maria speaks with pride of their stamina.

"My children don't ask for food if I haven't sold anything during the day. They don't bother me with 'Mama, I'm hungry, Mama, I'm hungry.' Of course, when meal time comes they begin to come around and the little girl says, 'Are we going to eat, Mama?'

" 'No', I say.

" 'Why not?'

" 'I have no money today.'

"Then later, she says to me, 'Mama, if there's nothing today, then we're not going to eat.'

" 'That's right.'

" 'Oh, well, then I'm not going to ask any more.'

"They are good children. They accept it."

Illiterate herself, Maria decided to send the ten-year-old boy to school last year. She bought him a colored pencil and writing pads, but after the first day he came back without them. The other children began to make fun of him and beat him. He came home crying one day and refused to go back. Now he spends his time, as Maria puts it, "playing around the street, sliding on a piece of cardboard."

New clergy opposes meek acceptance of hardship, now pushes hard for social betterment.

Birth control—or abortion

With more than 400 people per square mile and a growth rate which doubles the population about every 20 years, it is not surprising that El Salvador has family planning programs. What is surprising is the degree of opposition to them—less from the Roman Catholic Church than from ultraconservatives on the one hand and revolutionaries on the other. Thus, frequent editorials from the conservative *El Diario de Hoy* maintain that "to populate America is to civilize America," and that family planning is a foreign plot to "dissect the wombs of Latin American mothers and castrate Latin males." The radicals regard family planning as a palliative which might slow the revolution. The result has been the exclusion of demographic and contraceptive teaching from the university, and a low-key, low-priority government program of family planning. The victims of this situation are neither the articulate intellectuals nor the feet-dragging bureaucrats, but the low-income women who continue to rely on an age-old technique of population control—abortion.

In the maternity hospital of San Salvador, one out of every five women is getting rid of a baby rather than having one. Virtually all these women arrive with incomplete abortions, many of them hemorrhaging and requiring emergency treatment and blood transfusions. About a dozen die every year; the others, after curettage and a few days' rest, are released—probably to conceive again.

Since abortion is a criminal offense, it is not surprising that few women admit that the abortion was induced, but it is of interest that the hospital classifies no more than a third of them as "spontaneous."

Dr. Madrigal of the maternity hospital staff gave us a succinct explanation of the technology, economics and politics of abortion.

"The method they use in 90 percent of the cases is *la sonda,* a rubber instrument. Then they use all sorts of metallic instruments like nails or umbrellas. Once I had a patient come in with a pen still in the cervix. Lately they use vaginal douches of half water and sulphuric acid, I think. I can tell most of the time if they've used the *sonda* because of the lesions it causes in the cervix."

Rosa Perez is a 34-year-old woman on her fifth pregnancy, with two living children, the youngest five years old. Since she works as a live-in maid, the children live with her mother, and she sees her common-law husband every eight days. She claims she went to a practical nurse she had heard about from a friend, and was not sure she was pregnant. The nurse told her she had "dangerous coagulants which could form tumors and should be treated. She put me in a big chair and stuck in some pincers, like scissors. When I saw blood she said, 'If you bleed a lot, buy some ergotrate pills at the drug store.' " She paid eight dollars, and

Homeless country peasants bed down against wall after coming to San Salvador with vain hopes.

after experiencing a variety of symptoms came to the hospital where she "discovered" that she had had an abortion.

A social worker then located the abortionist, a 77-year-old, almost illiterate midwife, blind in one eye, and with partial vision in the other. Living in conditions described by the social worker as "dirty and frightening," she had a "simulated gynecological chair, a douche bag on the wall and a small adjoining room, where she probably keeps her tools." In the course of a lengthy interview she repeatedly denied ever performing an abortion, but had some interesting comments to make about what might be her principal current threat—the intrauterine device: "Women are putting in those 'spirals' to keep from having children. A woman came to me with a terrible pain and hemorrhaging. I examined her and found that little ring inside which I'd never seen. I've got it right here in a can! They get pregnant anyway with that thing in. The child is born with it in his stomach, or on the top of its head."

No single solution in sight

It is clear that no single solution, not family planning, not education, not land reform, not housing, is going to make rich nations out of poor ones. Further, to achieve satisfactory reforms in any *one* of these areas will require far more will, imagination and resources than is currently being invested either by national or international agencies. That this will happen seems unlikely, in view of the tendency to seek external villains when things get bad enough. If Uncle Sam is too remote and powerful for more than verbal abuse, internal violence may temporarily break out.

This occurred tragically in 1969 when Salvadorans and Hondurans, ethnic, religious and geopolitical brothers, went to war. The effects of continued military buildups and cessation of trade relations on economies as fragile as those of Honduras and El Salvador can easily be imagined. What can also be imagined is the worsening poverty and deepening bewilderment of the ultimate victims of this nightmare. As a Salvadoran coffee farmer put it:

"In the last 20 years our population has doubled and the poor people have no means to defend themselves in the new rhythm of life of the nation. . . . These humble people I see growing poorer every day. Now the solution to this problem, sincerely, I cannot see from any side."

Under idealized picture of motherhood, the unvarnished reality waits for treatment.

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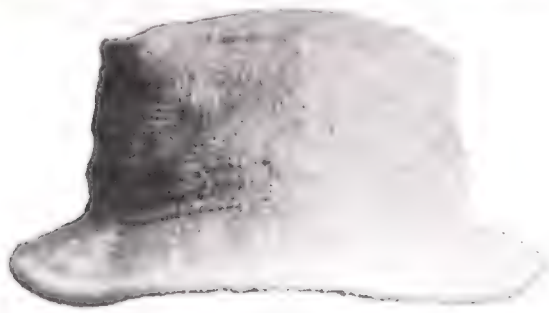

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Book reviews

Working
Studs Terkel
(Pantheon, $10)

After law school, which he loathed, Studs Terkel flunked the bar exam. It's a good thing that he did. A legal career might not have yielded much in the way of astonishment, and Terkel needs to be astonished the way sailboats need wind.

His mission and passion is to figure out and report what's on the minds of his countrymen. His tool is the tape recorder, a dubious instrument in less sure hands but a safe one in his. Three times he has gone forth to talk, always avoiding formal questions and answers, and weaving what he hears into books. *Division Street: America* focused on a place (Chicago) and *Hard Times* on a period (the Great Depression). Here now is *Working*, subtitled "People Talk About What They Do All Day and How They Feel About What They Do."

So vast and even arrogant a job would be easy to botch, but Terkel has avoided the pitfalls. His 132 subjects, no doubt startled by attention as total as his, talked to him so eloquently that their interviews became arias. A veteran gravedigger still wears black sunglasses on the job, "because your eyes is the first thing that shows when you have a big emotion." An advertising man admits to "very elaborate technological-type fantasies: a benign totalitarianism controlled by me." A broadcasting official is proud to average some 80 long-distance phone calls a day. A janitor keeps an eye on his neighborhood for the FBI. (More people than ever before, Terkel says, are engaged in surveillance: the watching of other people).

A career schoolteacher reveals a credo that must be common: "If you don't have discipline, you won't have a nation." I'd like to know whether the set of that teacher's jaw is as grim as I imagine. If Terkel has one failing, it's that he doesn't tell us what his people look like.

A lot of these conversations are punctuated with nervous little laughs. Last Saturday, a jockey says, "a horse threw me out of the gate right here on my nose. I had all my teeth knocked out. (Laughs.)" An assembly-line worker laughs to tell how her rest periods are measured not in minutes but seconds.

A stewardess, telling Terkel about lecherous passengers, says that "even when they pinch us or say dirty things, we're supposed to smile at them. . . . That's the main thing, smile."

Are no smiles unprogrammed? Well, a few. A retired shipping clerk, in one of the book's more poignant sequences, tells of evening songfests in a neighborhood tavern. A priest, overcoming generations of automatic niceness, makes a scene at a stockholders' meeting to demand pollution controls. An advertising woman, fed up with free-floating tension, quits to work at half the pay as a boys' school librarian and is elated.

But most workers, most of the time, feel demeaned by and removed from their jobs. "It isn't that the average working guy is dumb," one laborer tells Terkel. "He's tired, that's all. . . . Unless a guy's a nut, he never thinks about work or talks about it."

Working, however, is a feast of talk, addictive as a dish of macadamia nuts, eclectic as a big-city phone book, stirring up questions enough to ponder for years. It is also, of course, astonishing.

—Jane Howard
Author of *A Different Woman* and *Please Touch*.

Whistler
Stanley Weintraub
(Weybright and Talley, $12.50)

Even during his lifetime, James Abbott McNeill Whistler seemed to disappear in a cloud of anecdotes about him. Posthumously, he has proved even more elusive. We have been left all the trappings, like so many sloughed snakeskins or discarded costumes—the Bohemian, the Dandy, the Esthete, the Rebel, the Wit,

the Bully, the Genius, the Artist, and sometimes the Failed Artist. But where is the man?

Occasionally, an expedition sets off to find him on the wilder shore of neurosis. A recent biographer, Roy McMullen (*Victorian Outsider,* Dutton, 1973), suggested that by assuming his mother's family name Whistler may have "symbolically rekilled his army-officer father and married his dear mummy." And so it has gone, more or less, until Professor Stanley Weintraub, a recognized authority in 19th-century English cultural history, has fleshed out Whistler by returning him to the everyday world he inhabited.

Whistler etched this *Self-Portrait with White Lock* (shown in detail) about 1877.

Alone on stage, firing off epigrams at cardboard figures—the mere likes of Ruskin and Oscar Wilde—Whistler was at most a glittering illusion. But in contact and confrontation with a lifetime of motivated personalities, as a mover in his evolving situation, affected and affecting, Whistler takes on a becoming solidity. He no longer seems perversely odd and embattled. One sees him suddenly not playing the Outsider but being the Joiner, a man trying to get in and not always liking the rules of the game.

He was, to be sure, a gifted artist, but that was the minimum requirement to outfit him for this arena. He exploited his natural charm, giving it an artificial luster in the process, and he invented a number

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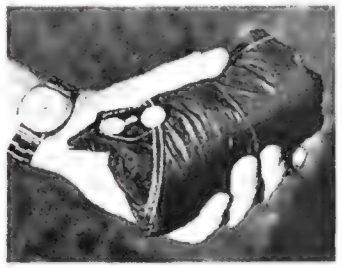

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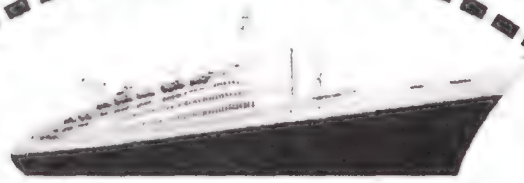

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of credentials—birth in czarist St. Petersburg, for instance, instead of in Yankee Massachusetts—in order to make himself more interesting.

As with other men, Whistler's affectations became in time permanent and indivisible features of his personality. His aggressions were his defenses. And, as he could not shake them off when he had established himself, they came finally to seem a symptom of decline, in the same way that the attractive pugnacity of youth is transformed into splenetic bad temper by the arrival of old age.

Showing us in a careful, detailed way what Whistler was up against, where he came from, how he failed in young manhood and regrouped his forces, what Paris meant to him, and how he managed his mature life in the stratified society of Victorian London, Professor Weintraub has humanized him and, on the whole, has made him seem less willful and absurd. Whistler is more fascinating as a man of feeling than as a poseur. But the triumph of this book is that the man Whistler likewise illuminates his time and place.

This biography is unlikely to be superseded for a long time. What one wishes, beyond it, is a similar meticulous treatment of Whistler's art.

—*Gene Baro*
Critic and lecturer on American culture

The Siege of Atlanta, 1864
Samuel Carter III
(St. Martin's Press, $12.50)

This book is especially recommended to present-day Jeremiahs pondering whether the nation will survive. It is more than another Civil War contribution; it probes Americans' will to endure as characterized by the people of Atlanta during the city's finest several months.

Mr. Carter does two things—traces the slow retreat of the Confederate army under foxy General Joseph E. Johnston through mountain and dale toward Atlanta (the "Gate City"), and he lets the tortured population speak through their memorabilia. There lies the book's strength, the intermingling of the military campaign with the anguished, but indestructibly spirited, letters and diaries of the embattled people.

While May passed into hot summer, Atlantans heard the approaching roar, and wondered if Johnston's retreat would

ever stop. Anxiety smothered everything. Men, women and children strengthened cellars against expected bombardments, dug "gopher holes" in backyards and made their homes into tiny war factories. Trainloads of wounded from the not-distant fighting filled the streets with groans and screams, and there was little medication. Women made bandages; hotels and public buildings became hospitals. The incoming wounded would total 75,000 before summer's end.

Shortages and inflation struck. Wild dogs and crazed cats roamed the city, while delinquents and vandals rampaged. Deserters from Johnston's battered army straggled in. One woman wrote in her diary: "These marauders, calling themselves soldiers, and wearing ragged gray garments, killed and skinned mother's two hogs intended by her for the next year's bacon."

On August 9 General Sherman's big guns arrived from Chattanooga, and the real bombardment began. A housewife pressing her husband's shirts fell mangled across the ironing board; a girl on the street fell dead in a pool of blood; six members of a family fled to their "bombproof" where a direct hit left their bodies unidentifiable. Before long, about 5,000 shells had fallen. There was no abatement. One woman stuck unperturbed to her knitting, merely noting that "we have had to stay in the cellar all day."

In mid-July, Jefferson Davis replaced Johnston with the impetuous General John Bell Hood. Sherman noted that by putting Hood in command, "the Confederate Government rendered us a most valuable service." The soldiers were infuriated. They loved Joe Johnston. A nurse, recording the reaction of hospitalized troops, observed, "The whole post seemed as if stricken by some terrible calamity."

There was no panic when the Federal troops entered Atlanta on September 2, following Hood's departure. But then came the big blow: Sherman ordered women, children and the aged out of the city. To where? Anywhere. He would take those so disposed into the North, while Hood could take the others into the South. In immediate reply to Sherman, Hood called it an act of "studied and ingenious cruelty."

By then Atlanta held little for anybody to want. Nearly everything that Sherman's bombardments had spared was de-

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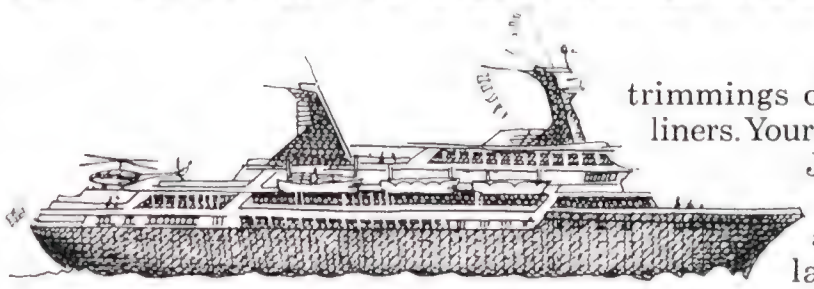

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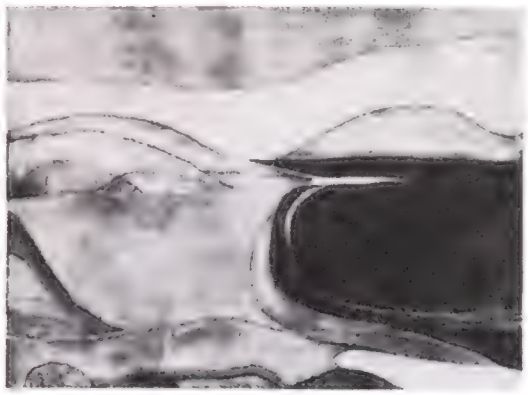

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stroyed by Hood before he pulled out, in order to prevent Sherman from getting anything of use. Finally, when Sherman left in November, more fires were set.

Mr. Carter goes on to detail the famous March to the Sea, which seems anticlimactic. Maybe it all should have ended when the people, chased from their homes, returned within a week to their ruined city and, with bare hands and asking nothing of anyone, began to rebuild.

Today Atlanta is beautiful, prosperous and progressive. Like San Francisco and New Orleans, it is seldom maligned. And should it ever be, the answer might come: Look back. There is bound to be greatness in a breed that literally clawed its way upward from the ashes.

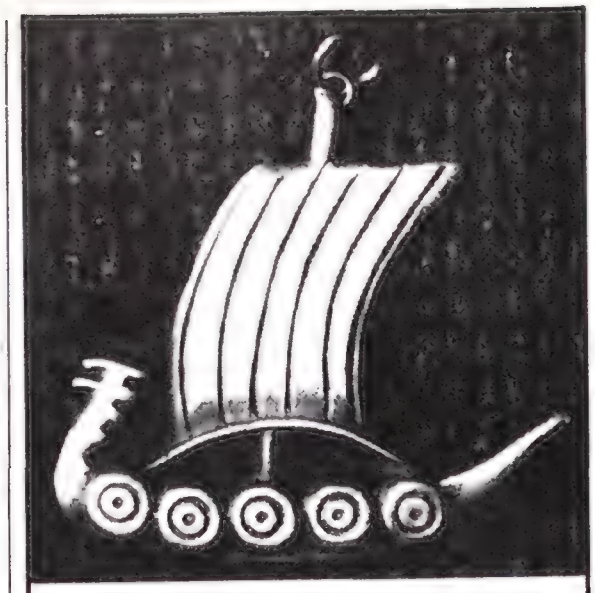
—*Scott Hart*
Author of *Washington at War: 1941-1945*

The Cheetah, The Biology, Ecology, and Behavior of an Endangered Species
Randall L. Eaton
(Van Nostrand Reinhold, $12.95)

This book, a comprehensive review of the biology of *Acinonyx jubatus,* is an important work that faithfully places behavior, ecology, management and conservation into an integrated perspective. The author combines his observations on wild cheetahs with a great deal of information derived from his personal experiences with captive cheetahs in several U.S. wild animal parks. He stresses the utility of research programs carried out in such large wildlife parks as Lion Country Safari in Laguna Hills, California, and World Wildlife Safari in Winston, Oregon; it is heartening to see that some progress has been achieved in the breeding of this species in captivity.

The section on the ecology of the cheetah deals with food habits, prey selection and hunting behavior. Although Eaton has previously published much of this information in specialized periodicals, he has integrated new information to produce a thought-provoking report which raises a number of questions that now await further research.

The interpretation of the cheetah's social behavior is somewhat controversial among zoologists. Field data would seem to indicate that the adult female cheetah lives alone, except for her dependent offspring. Groups of cheetahs, which are



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occasionally sighted, are either mothers with half- to three-quarters grown offspring, or a group of littermates which are still hunting as a unit. Eaton offers evidence for the existence of hunting groups comprised of males—perhaps males related by descent.

There is some evidence to indicate that several males may court a given female cheetah at the same time. Eaton suggests that in captive management perhaps two or more adult males be introduced to an estrous female to increase chances for a successful mating. Although this procedure has met with success at World Wildlife Safari, it is by no means clear that this is a necessary condition for mating to occur. Eaton attempts to evaluate critically the problems of captive propagation and offers several suggestions for improved captive management.

He has written a book that does not compromise accuracy and detail, and which should appeal to a wide audience of professionals and laymen alike.

—John F. Eisenberg
Resident Scientist, National Zoological Park, Washington, D.C.

The Story of Medicine in America
Geoffrey Marks and William K. Beatty
(Scribners, $10)

Graphic description is this book's key to success. For the reader who is not familiar with the history of American medicine, the authors provide just enough detail and the right kind of particulars, often in the original words of the participants. Daniel Drake, for instance, describes his apprenticeship in the early 1800s to one of Cincinnati's leading physicians: "But few of you have seen the genuine old doctor's shop of the last century, or regaled your olfactory nerves in the mingled odors which, like incense to the God of Physic, rose from brown paper bundles, bottles stopped with worm-eaten corks, and open jars of ointment, not a whit behind those of the apothecary in the days of Solomon; yet such a place is very well for a student. However idle, he will be always absorbing a little medicine, especially if he sleeps beneath the greasy counter."

The authors' thumbnail sketches tell stories of human interest and occasionally state principles that are basic to medical history. The section on Samuel Thomson (1769-1843), founder of a medical sect devoted to the use of botanicals (plants), reveals that a childhood discovery led to his lifelong promotion of the plant lobelia as the most important "article" in his practice. He fed this plant, which induces vomiting, to his playmates and turned his discovery into a prank.

We can rejoice with John Wheelock, son of the founder of Dartmouth College, when the medical school began to flourish in 1810. He then thanked God publicly for oxygen, hydrogen and "for all the gasses." He continued by listing the parts of the brain, "We thank Thee for the Cerebrum; we thank Thee for the Cerebellum, and for the Medulla Oblongata."

One warning, which is to be expected about any book that covers so much material and remains untechnical: It creates the illusion that the issues discussed have been completely investigated. In the section on heart transplants, for instance, I wonder why the authors do not refer to the autobiography, *Christiaan Barnard: One Life,* when they discuss the ethics of this treatment?

All of the authors' generalizations and facts are based on the work of many fine historians of medicine and science and are, therefore, known to professionals. However, there is no better time for a wider audience to become aware of how medicine evolved in this country. I can think of no book that provides as fine a mix of historical facts, anecdotes, selected references and bibliography, and I would recommend it to satisfy a curiosity about American medicine from Colonial times to the present. The insatiable will look into the footnotes and bibliography and know that they are well directed.

—Audrey B. Davis
Associate curator, Division of Medical Sciences, National Museum of History and Technology, Smithsonian Institution

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"Music from Marlboro" presents selections from Brahms, Berg and Schubert in a concert of chamber music—April 6, 5:30 P.M., Baird Auditorium, Museum of Natural History.

The "Jazz Heritage Series" features Gunther Schuller performing various works by well-known jazz composers in "An Experiment in Interpretive Jazz"—April 21, 4:30 P.M. workshop and 8 P.M. concert, Baird Auditorium, Museum of Natural History.

For information on the above events, call (202) 381-5395.

World Petrarch Congress

To commemorate the sixth centennial of the death of Francesco Petrarca (see page 48), the Folger Shakespeare Library in Washington will play host to a World Petrarch Congress from April 6 to 12. Some of the events will take place at the Catholic University, the Museum of History and Technology, the National Gallery of Art and the Library of Congress. A six-week loan exhibition of Petrarch's manuscripts will open at the Folger Library on April 6. For further information, call (202) 546-4800.

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Queen Juliane Marie, 1970 (bust modeled in 1776) from traveling exhibition, "200 Years of Royal Copenhagen Porcelain."

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San Antonio, Texas—April 20-26: The San Antonio Fiesta, a tradition since 1891, with its vibrant, colorful history and multicultural heritage. Informal lectures and discussions with local groups and historians provide an in-depth view of the fiesta activities.

Crafts of Arkansas—May 11-18 and May 18-25: A rare opporunity for an intimate encounter in seldom visited areas to observe early craft techniques and the artisans preserving them (each tour limited to 12 participants).

Santa Fe and Taos, New Mexico—June 19-27: A comprehensive look at the Indian, Spanish and Anglo-Saxon cultures which comprise the heritage of the Southwest. From the missions and pueblos to the museums in Albuquerque, participate in discussions, films, lectures and field trips.

Boston Art and Architecture—June 21-24: Federal and Georgian architecture and a visit to the Museum of Fine Arts; a reception at the Bulfinch building which houses the Smithsonian's Archives of American Art.

Two tours are planned for July, a **Colorado River Float** in Canyonlands National Park, Utah, and a trip to the Berkshire Hills of Massachusetts during the **Berkshire Festival.**

In August a two-week trip to **Iceland** will be the featured tour.

FOREIGN STUDY TOURS

Victorian Germany—May 7-25: Castles and palaces associated with Queen Victoria, including Prince Albert's birthplace at Rosenau.

Ethiopia and Kenya—May 24-June 14: Ancient and contemporary cultures from Aksum to Lalibela, plus several days in Kenya.

Black Sea Cruise—September 18-October 6: Depart and return Athens, via Turkey, Bulgaria, Romania and Russia.

Afghanistan and Pakistan—October 20-November 16: Archaeological and historic sites.

For information on specific tours, write Mrs. Rosa Mae Howe, Domestic Tours, Room SI 106, or Miss Bliss Schumann, Foreign Tours, Room SI 123, both at Smithsonian Institution, Washington, D.C. 20560.

Museum of Natural History
"Bhutan: The Land of Dragons" is a continuing exhibit in the first floor foyer that contains ethnological objects from the small Himalayan country of Bhutan. The items on display reflect the religion, trade, transport and architecture of Bhutan and include costumes, textiles, weaving, basketry, pottery and a slide show.

National Portrait Gallery
"Abraham Lincoln: The White House Years" marks the anniversary of the assassination of Lincoln. It is a documentary exhibition dominated by William Cogswell's nine-foot-high portrait of President Lincoln. Surrounding the portrait are photographs, cartoons and other items that reveal how Lincoln changed during the shattering Civil War years—opens April 14.

Anacostia Neighborhood Museum
Representative works from the "Barnett-Aden Collection" are being shown through April 28. Prominent in the highly praised private collection are artists who emerged from the period now referred to as the "Harlem Renaissance." Included are the paintings, prints and sculptures of William H. Johnson, Jacob Lawrence, Romare Bearden, Jack Perlmutter and Edward Bannister.

Puppet Theater
"Pinocchio" continues in the Arts and Industries Building. Performances are on Wednesdays, Thursdays and Fridays at 10:30 and 11:30 A.M. and on Saturdays and Sundays at 11 A.M., 12:30 and 2:30 P.M. No children under three admitted. For additional information, call (202) 381-5395.

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Metro construction has made parking on the Mall near the Smithsonian complex extremely difficult. All parking prior to 10 A.M. is restricted. The use of public transportation is recommended.

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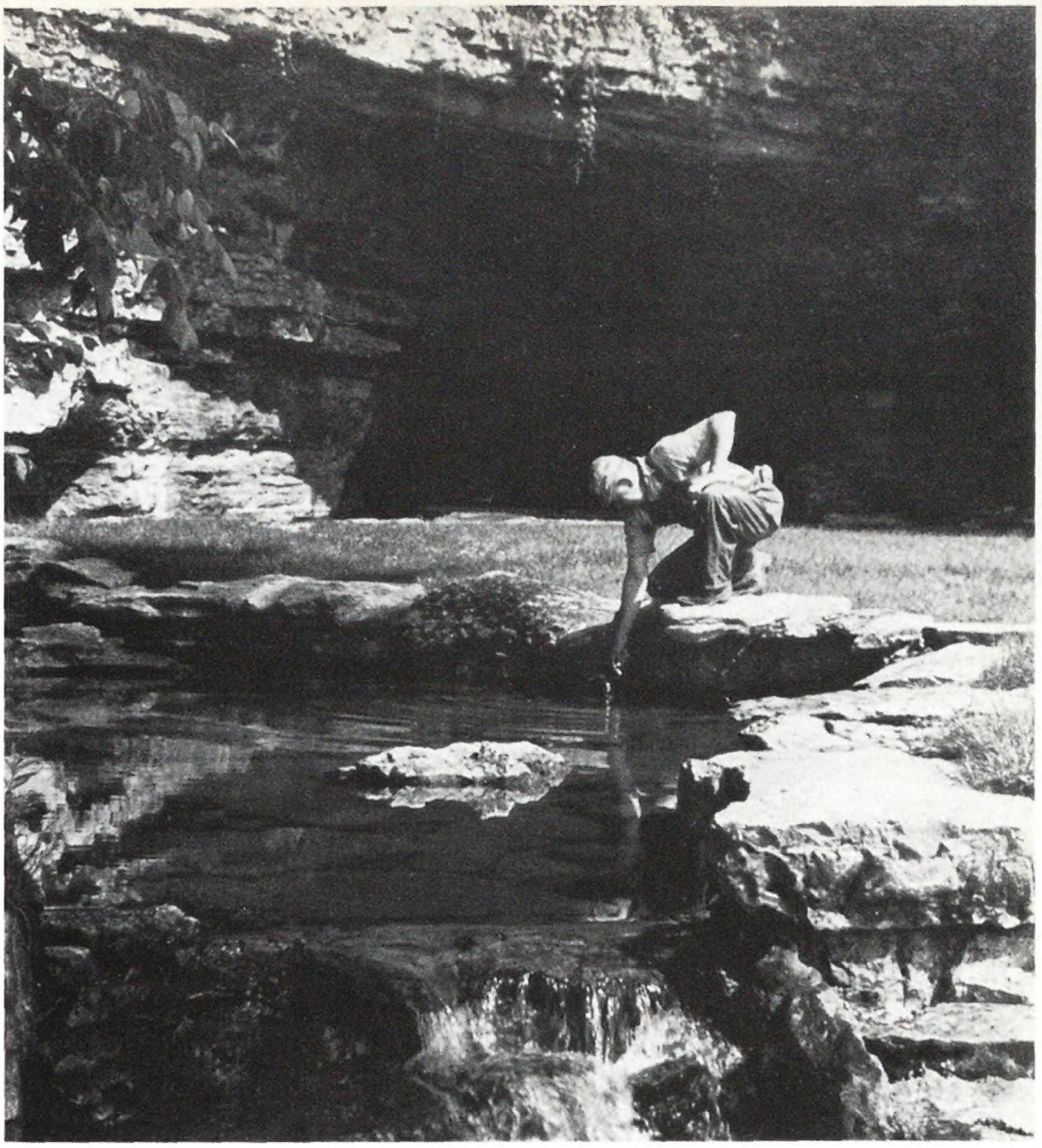
There are up to 70 different Smithsonian-sponsored exhibitions on display each month throughout the United States and Canada. For a complete listing and information on how to bring an exhibit to your area, write: Traveling Exhibition Service, Smithsonian Institution, Washington, D.C. 20560.

- Charleston, West Virginia—"William H. Johnson: 1901-1970" (Charleston Art Gallery, April 13-May 12).
- Mt. Pleasant, Michigan—"Lithographs from a Workshop: Landfall Press" (Central Michigan University, April 6-May 5).
- Hayward, California—"The Persistent Crafts of Poland" (Cabot College, April 6-May 5).
- Battle Creek, Michigan—"The Phenomenon of Peter Max (I)" (Civic Art Center, April 13-May 12).
- High Point, North Carolina—"Handicrafts of the Southeast" (High Point Museum, April 20-May 19).
- Boston, Massachusetts—"German Posters of Today" (Goethe Institute, April 20-May 19).
- Salt Lake City, Utah—"Education of an Architect: A Point of View" (University of Utah, April 20-May 19).
- Corvallis, Oregon—"Our Only World (I)" (Oregon State University, March 30-April 28).
- Greensburg, Pennsylvania—"Permutations: Earth, Sea, Sky" (Westmoreland County Museum of Art, April 20-May 19).

Contributing Memberships
Persons who contribute $50 or more annually to the Associates support the Institution's national educational programs and enjoy additional privileges. Graduated benefits include:

- Assistance in communicating with any part of the Smithsonian.
- Information on any museum in the world in advance of a visit there.
- Smithsonian annual report and other publications.
- Invitations (when in Washington) to exhibition previews and special events, including admission of a guest.
- Research service for questions about subjects related to the Smithsonian.
- A remembrance from the Smithsonian in the form of a commemorative object or work of art. Write: Contributing Membership, Smithsonian Associates, Smithsonian Institution, SI 118, Washington, D.C. 20560.



THE ONE AND ONLY REASON Jack Daniel settled in the Hollow was this cool limestone spring.

Nearly a century ago folks said Jack Daniel wasn't much at business. For he put his distillery twelve miles from the nearest railroad. But you see, Mr. Jack was a whiskey man first, a business man second. So he settled down near this cool limestone spring, where to this day the iron-free water flows pure and perfect for making Jack Daniel's. After a sip, we believe, you'll see why we still regard our spring so highly. And why Jack Daniel, everything considered, wasn't so bad at business after all.

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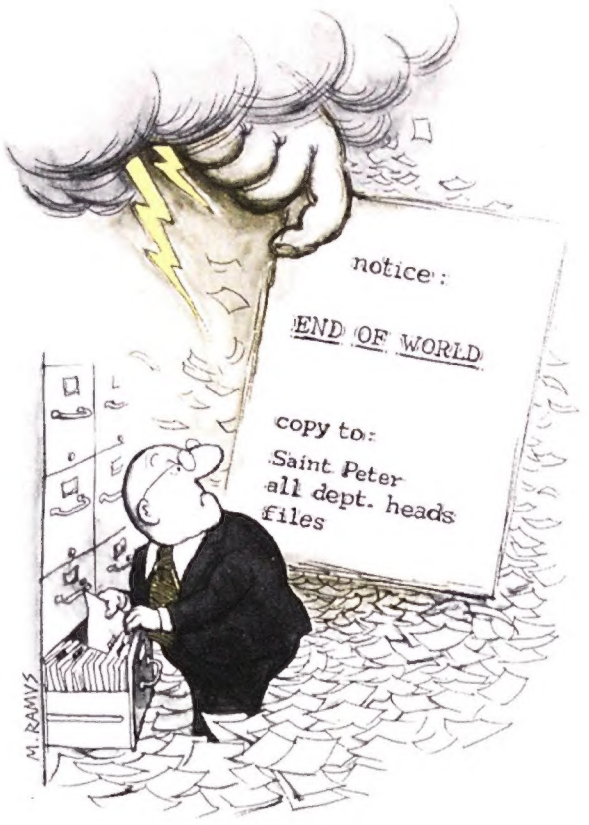
By Patrick Ryan

Man's fate—smothered in a blizzard of paper



Time was—sadly long gone—when if you wanted a second copy of your edict, memorandum or sonnet, you had to send for a second slab of rock. In the first recorded case of duplication, after Moses had shattered the original Ten Commandments, God commanded him to bring two more "tables of stone" up Mount Sinai and promised that "I will write upon these tables the words that were in the first tables, which thou brakest." Even in the early part of the 19th century, any business gentleman requiring a file copy of his latest well-turned epistle had to employ a copying clerk to rewrite it by hand. Since then, the science of copy-making has ravaged on through ever-multiplying processes of hectography, stenciling, offset printing, photocopying, xerography and microfilming. During the last couple of decades copying-machine manufacturers have taken prestige advertisements to proclaim that no office can be too small to need a model and no employee too dumb to copy-it-himself. None, comes the message, can hope to aspire to space-age office efficiency without instant access to a streamlined, non-staining gadget which will provide instant facsimiles of any document thrust into its maw.

Once, in some musical melancholy, we wondered where had all the flowers gone? Let us now ponder, with more sinister foreboding, where in heaven's name do all the copies go? Since the first marketing of xerographic machines, well over 600,000 photocopiers have been bought or rented for office workers who previously had got on fairly well without them.

Hypothetical savings in a secretary's hours are claimed for the reproducing devices, since she no longer has to type up the necessary copies of her office's memorable papers. In practice, of course, any such savings are heavily outweighed by the increased number of hours it takes her to distribute numerous copies to her boss, file those received from other sources and produce replicas of magazine recipes, checkpoints for her fiancé's car rally and improper limericks deemed worthy of office circulation.

Both the civil and armed services have been severely afflicted by the disease. In my martial youth I met a venerable general who held that the conduct of warfare had been ruined by the typewriter. Before it provided multicopying facilities, a commanding officer who attended a prebattle order group took down in his own fair hand the vital elements of his general's plan of attack. But thanks to fully automated orderly rooms today, everybody is issued 12 duplicated sheets the moment he enters the door of high command. He is henceforth inhibited from taking any dashing, aggressive action by the detail of the lengthy orders and the confines of their parenthetical injunctions. When I suggested to the general that perhaps the Charge of the Light Brigade was caused by the absence of clearly written orders, he snorted scornfully and pronounced that the second fatal mistake of the military was to do away with the horse.

I had to admit some sympathy for this antipaper point of view when I later conducted a troop leave train on a three-day journey from Taranto to Dover. As we left the Italian port, a transport officer gave me a foot-high pile of paper consisting of 26 copies of the names, ranks and numbers of the thousand or so passengers on the train. I also received instructions to hand over a copy at each staging post we stopped at on the way. This I duly did and found that the last copy went in sequence to the stationmaster at Dover. On the return journey, they gave me another 26 copies for similar distribution en route. But I kept them inviolate until we got back to the South of Italy, when I tossed the mighty parcel into the sea. And nobody has ever raised a word against me.

Such a fate would doubtless be appropriate for most of the urgent copies of utterly unimportant epistles which are produced by the million today. Despite the efforts of a few thoughtful ecologists to recycle waste paper, available facilities will never keep pace with the torrential supply. The billowing waves of copies will mount inexorably, filling filing cabinets, overflowing shelves, and bursting from windows.

The Last Man, struggling for breath under paper avalanches, will finally go down to extinction suffocated by the myriad copies of his own Last Message.

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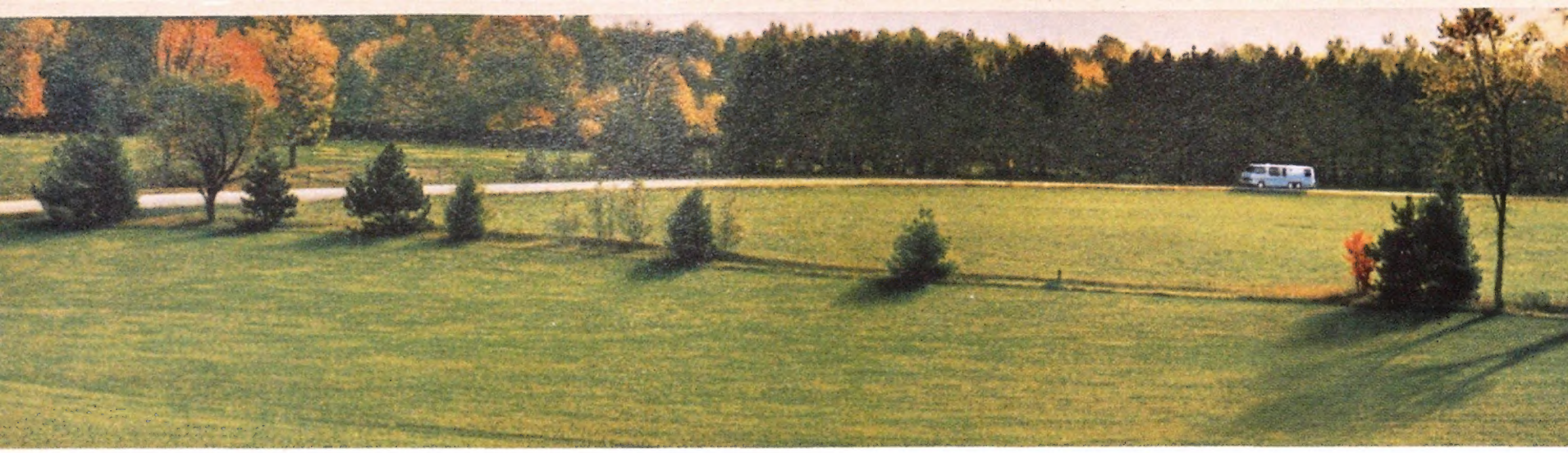

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